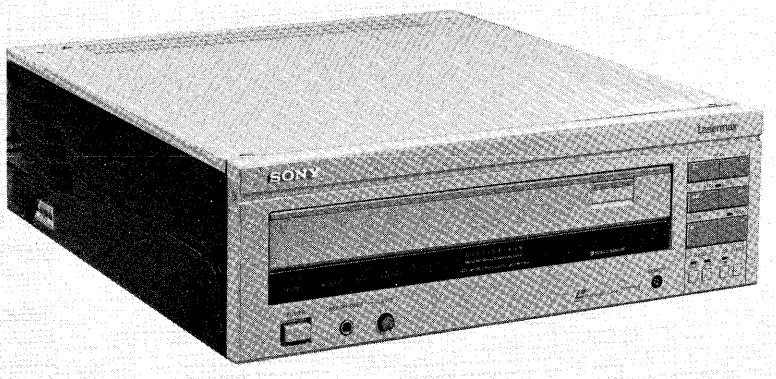
Lasermax
VIDEODISC PLAYER

LDP-2000

Revised-2



LaserVision

SPECIFICATIONS

Playback system

Pick-up method	Laser Vision format
Laser	Semiconductor laser diode (λ=7800Å)
Laser output	0.7 mW*
Videodisc	12" and 8"
Maximum playing time	CAV: 30 min./side CLV: 60 min./side
Spindle revolution	CAV: 1800 r.p.m. CLV: 1800 to 600 r.p.m.
Access time	CAV: 1.5 sec. (by frame) approx. $^1/_{300}$ times the normal playback time (by chapter) CLV: approx. $^1/_{100}$ times the normal playback time

Video

Signal	EIA standards, NTSC color
Output	1.0 Vp-p, 75 ohms unbalanced, sync negative
Resolution	Color: 360 lines
Signal-to-noise ratio	42 dB
VHF output	Channel 3 or 4 (selectable), 75 ohms unbalanced
Input	EXT SYNC: BNC 4 ± 1 Vp-p, 75 ohms unbalanced

Audio

Output	Line out: Less than 2 kiloohms 0 dB ± 2 dB [V] (100% MOD) unbalanced Headphones: 8 ohms −21 dB [V] max.
Signal-to-noise ratio	CX ON: 67 dB CX OFF: 55 dB
Frequency response	20 Hz to 20 kHz

General

Power requirements	120 V ac, 60 Hz
AC outlet	Unswitched, max. 300 W
Power consumption	75 W
Operating temperature	5°C to 35°C (40°F to 95°F)
Operating humidity	25% to 80%
Storage temperature	−20°C to 60°C (−4°F to 140°F)
Dimensions	Approx. 424 x 132 x 488 mm (w/h/d) ($16^3/_4$ x $5^1/_4$ x $19^1/_4$ inches)
Weight	LDP-2000-1: approx. 13.4 kg (29 lb 9 oz) LDP-2000-2: approx. 13.7 kg (30 lb 3 oz) LDP-2000-3: approx. 13.8 kg (30 lb 7 oz) LDP-2000-4: approx. 14.4 kg (31 lb 12 oz) LDP-2000-5: approx. 14.5 kg (31 lb 15 oz)
Supplied accessory	75 ohms coaxial cable (with F type connectors)

* This output is the value measured at a distance of about 1.6 mm from the objective lens surface on the Optical Block Ass'y.

SONY®
SERVICE MANUAL

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SUPPLEMENT-3

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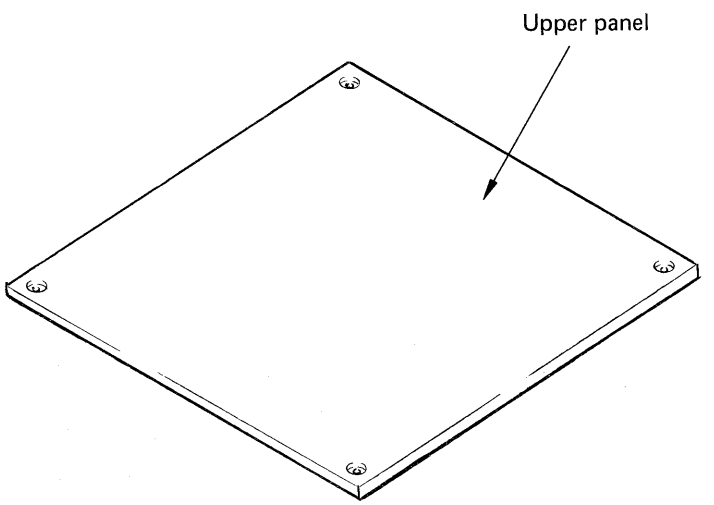
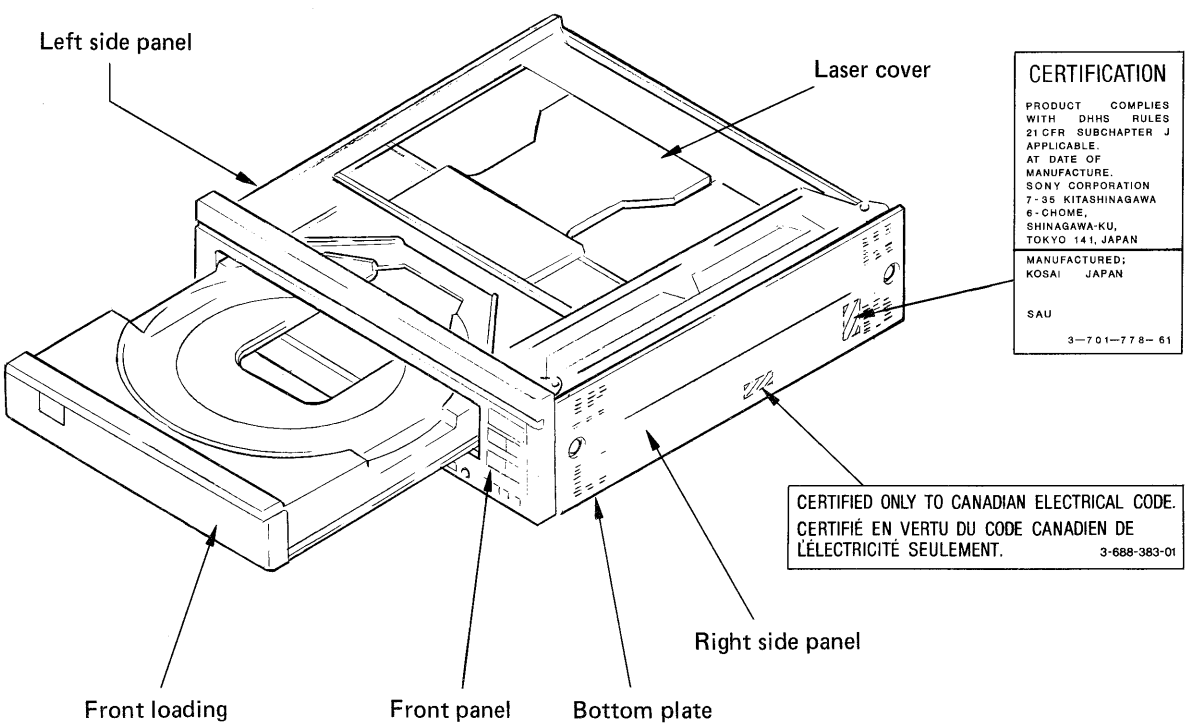
LASER WARNING LABEL





PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to follow carefully the instructions below when servicing.

WARNING !!

WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 25 cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

CAUTION:

The use of optical instrument with this product will increase eye hazard.

> **CAUTION**
>
> Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

1. Laser Diode Properties
   - Material: GaAlAs
   - Wavelength: 780 nm
   - Emission Duration: continuous
   - Laser Output: max. 44.6 uW*

     * This output is the value measured at a distance of about 200 mm from the objective lens surface on the Optical Pick-up Block.
   - Classification: Class IIIb
2. During service, do not take the Optical Pick-up Block apart, and do not adjust the APC circuit. If there is a breakdown in the APC circuit (including laser diode), replace the entire Optical Pick-up Block (including APC board).

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

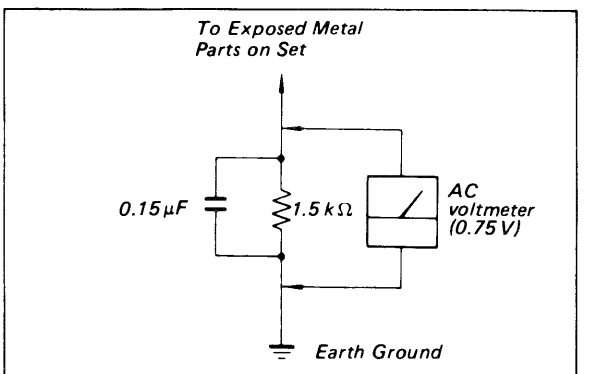


Fig. A. Using an AC voltmeter to check AC leakage.

SECTION 1
GENERAL DESCRIPTION

1-1. FEATURES

Features which are common for the LDP-2000 series are as follows :

No physical contact between pick-up system and disc
Because a laser beam is employed as the signal pick-up, there is no physical contact with the disc, which means no wear. In addition, because the pit pattern is recorded below the surface of the disc, it is not necessary to be constantly on guard against fingerprints and dust, making the video disc easy to handle.

Computer control
The built-in microprocessor controls almost all the functions of this player. Various functions, such as search and repeat, are possible with an external computer through an RS-232C interface connector.

Wide video disc applications
Various optional boards extend basic player capabilities to meet various application requirements. These boards can handle not only conventional video and audio signals but also digital data such as computer data or a compressed audio signal called Still Frame Audio (SFA). Still Frame Audio results in extended audio playback time while displaying still pictures.

High speed access
You can locate a particular frame on a disc within 1.5 seconds.

Remote control operation
By using the RM-2001 optional remote control unit, not only the operation of the main buttons on the front panel but also search and repeat operation are remotely controlled.

Automatic front loading of a disc
A video disc can be inserted from the front. This feature allows for space-saving configurations for the player and other peripheral equipment.

Mountable on a 19" rack
The video disc player can be mounted on an EIA standard 19" rack.

1-2. SYSTEM CONFIGURATION OF THE LDP-2000 SERIES

Player	Optional board installed	Optional board available for system-expansion	Manual supplied
LDP-2000-1		DB-2010* DB-2020 DB-2040	LDP-2000 series
LDP-2000-2	DB-2010	DB-2020 DB-2040	LDP-2000 series DB-2010
LDP-2000-3	DB-2010 DB-2020	DB-2040	LDP-2000 series DB-2010 DB-2020
LDP-2000-4	DB-2010 DB-2040	DB-2020	LDP-2000 series DB-2010 DB-2040
LDP-2000-5	DB-2010 DB-2020 DB-2040		LDP-2000 series DB-2010 DB-2020 DB-2040

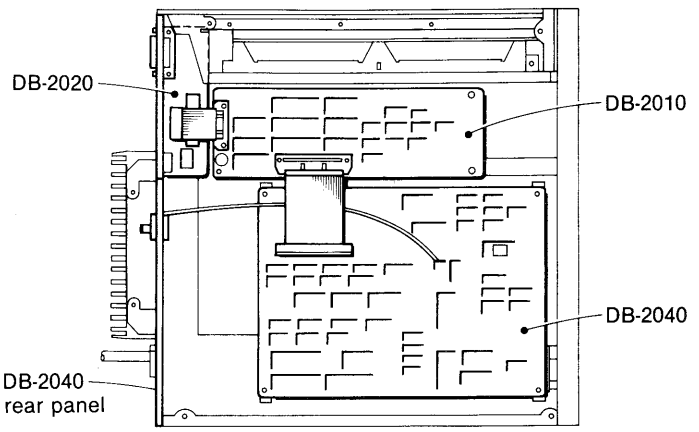
* The DB-2010 is indispensable to connect other optional boards.

Optional boards for the system-expansion of the LDP-2000 series

Model	Name	Function
DB-2010	Control Expansion Board	Connectors and control programs provided for the optional boards Playback of video disc with the "audio track control codes"* recorded on the audio track
DB-2020	Parallel Interface Board	IEEE-488 interface bus with an external computer for digital data recorded on a video disc
DB-2040	Computer Data/SFA Board	Decoder of digital data recorded on a video disc such as computer data, graphic data, SFA data, etc.

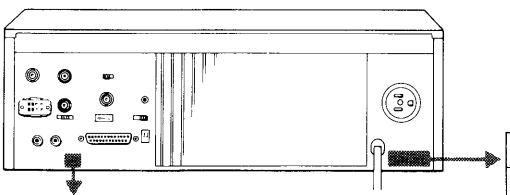
* These codes are employed only for Sony LDP-1000 and LDP-2000 series. The player is not capable of playing back a video disc with other control program codes.

Optional boards mounted on the player



1-3. NOTE ON VERSION/SERIES NUMBER LABELS

The label for the ROM version has been attached on the rear panel of the player at the factory.
When you mount an optional board on the player for the system-expansion, attach the label supplied with the board in the corresponding section.



VERSION		
DATA	EXP	BASE
	XX	XXX

Version label
BASE : LDP-2000 system ROM version
EXP : DB-2010 ROM version (supplied with the DB-2010)
DATA : DB-2040 ROM version (supplied with the DB-2040)

Series number label
The label corresponds to the series number of the player. For the series number, refer to the page 5.

1-4. TIPS ON VIDEO DISCS

TYPES OF VIDEO DISCS

CAV (constant angular velocity) disc
The CAV disc always rotates at a constant speed of 1800 r.p.m. and the laser beam moves from the inner part of the disc to the outer. Up to 30 minutes of playback (54,000 frames) is possible on one side of the disc. Each frame of the playback picture is recorded on one track and is reproduced in one rotation. The frame number is recorded on the track.
Flexible playback operation such as variable speed playback, repeat play, index display, or computer-controlled playback is possible using the frame numbers as reference.

CLV (constant linear velocity) disc
With the CLV disc, the rotational speed varies from 600 r.p.m. to 1800 r.p.m. so that a constant linear velocity is maintained. The laser beam moves from the inner part of the disc to the outer as with CAV discs. Playback of up to one hour is possible on one side of the disc, although only normal play, scan and search operations are possible. The elapsed playback time or the chapter number being played can be displayed on the monitor screen. Searches to the beginning of chapters or specified time codes is possible.

*1) Frames
The CAV discs have up to 54,000 "frames" which are numbered in sequence. One frame is recorded on one track, that is, a frame is played back with one rotation of the disc.
You can search for a particular frame quickly or repeat a particular sequence of frames.

*2) Picture stop
When the player detects this code, the playback enters the still mode. During search and repeat operations, the code is ignored. During "scan" and "fast (x3)" modes, the code may be ignored sometimes.

*3) Chapters
There are CAV and CLV discs on which "chapters", as the chapter of a book, are pre-recorded. If a chapter number is displayed after a frame number has been displayed (on a CAV disc) or after playback time is displayed in minutes (on a CLV disc) when you press the INDEX button, the data are pre-recorded in chapters.
You can easily search for a particular chapter and play it back repeatedly.

*4) Lead-in/Lead-out
When the player detects the lead-out code, it returns to the beginning of a disc, detects the lead-in code and repeats playback or stops at the beginning of the program area according to the AUTO REPEAT switch setting.
When the player detects the lead-in code or lead-out code in SCAN mode, the same result will be obtained.

Note
The vertical blankings are muted.

COMPARISON OF SONY VIDEO DISC CODE TYPES

type	purpose	location on disc	capacity	customer's creation method	encoding method	for use with player model:
I. CAV Discs						
Vertical blanking (partial listing)						
—frame number *1)	frame access	all vertical blankings	00001 to 54000	not available	added automatically during mastering	any
—picture stop *2)	automatic stop on a frame, during "play" and "step" modes	designated vertical intervals	up to 54000	list of frame numbers to have stops	added during mastering	any
—chapter number *3)	divide content into chapters	designated vertical blankings	00 to 79; min. chapter = 30 tracks	list of first/last frame nbrs of all chapters	added during mastering	any
—chapter stop	automatic stop on first frame of a chapter, during "scan" mode with the chapter number displayed	designated vertical blankings	first 400 tracks of the chapter; min. chapter = 800 tracks	list of chapter numbers to have stops	added during mastering	any
Audio Track Control Codes	interactive playback with stand-alone player	in audio Ch. 2 of first frames	1 "dump" = 1KB/150 frames max 7 dumps	Logic Generator/Checker on microcomputer; send in TTY or FD with videotape	added during mastering	LDP-1000 (1 dump); LDP-1000A (5 dumps); LDP-2000 with DB-2010 (7 dumps)
SFA	very long audio playback per disc side	in video signal; black/white on each line = 0's and 1's	1.3 sec/frame; an SFA unit = min. 2 frames, max 32 frames;	offline-edit analog audio; bring in audiotapes with edit list	at encoding sys: analog to digital conversion; video formatting; onto master tape	LDP-1000A with SFA-1000; LDP-2000 with DB-2010 and DB-2040
Computer Data	"One-media" concept (digital data on videodisc for external microcomputer)	in video signal; black/white = 0's and 1's	4096 bytes/frame (= 1 sector)	microcomputer to write data, graphics; bring in FD	at encoding sys: video formatting; onto master tape	LDP-2000 with DB-2010, DB-2020 and DB-2040
III. CAV/CLV Discs						
Vertical blanking						
—time code number	time code access	all vertical blankings	00 hr 00 mins to 01 hr 00 mins	not available	added automatically during mastering	any
—chapter number	divide content into chapters	designated vertical blankings	00 to 79; minimum = 30 tracks	list of first/last frame nbrs of all chapters	added during mastering	any
III. CAV/CLV Discs Vertical blanking						
—Lead-in *4)	locate the beginning of the program on a disc	designaled vertical blankings	—	not available	added during mastering	any
—Lead-out *4)	locate the end of the program on a disc	designated vertical blankings	—	not available	added during mastering	any

1-5. PRECAUTIONS

On safety

- Operate the unit with 120 V ac, 60 Hz. When you operate with voltage other than 120 V (100—240 V), consult your nearest Sony service facility.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the wall outlet if it is not to be used for an extended period of time.
- To disconnect a cord, pull it out by the plug. Never pull the cord itself.

On installation

Avoid placing the player in a location subject to:
— high humidity
— high temperature
— excessive dust
— mechanical vibration
— direct sunlight

Allow adequate air circulation to prevent internal heat buildup. Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation holes.

On operation

- Do not operate the unit right after having transported it from a cold location directly to a warm location or in a room where the temperature rises suddenly because moisture may condense in the operating section of the unit. Wait for about an hour before turning the power on in the new location or keep the rise in room temperature gradual. If the unit is operated with moisture condensation, the unit and the disc may be damaged. Therefore remove the disc immediately when there is a possibility of moisture condensation and no picture is obtained.
  To evaporate the moisture rapidly, leave the player turned on without a disc loaded.
- Remove the disc from the compartment after playing it, if the unit will not be used for any length of time. Do not transport the set with a disc in place.
- To open or close the disc compartment, press the OPEN/CLOSE button. Do not pull or push the disc compartment forcibly.
- When the disc compartment is in the open position, do not press down on it strongly, or place heavy objects.

On cleaning

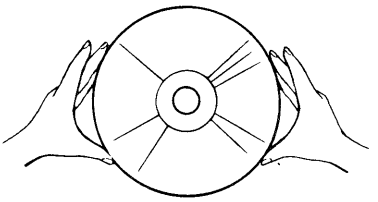
Clean the cabinet, panel and controls with a dry soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent, such as alcohol or benzine, which may damage the finish.

On packing

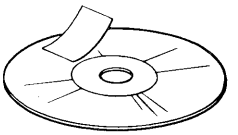
Do not throw away the carton and packing materials. They make an ideal container in which to transport the unit. When shipping the unit to another location, repack it as illustrated on the carton.

NOTES ON HANDLING VIDEO DISCS

Handle the disc by its edge, and keep the disc clean.



Do not stick paper or tape on the disc surface.



Not this way

Do not expose the disc to direct sunlight or heat sources such as hot air ducts, or leave it in a parked car in direct sunlight which can result in a considerable rise in the temperature.

Before playing, clean the disc with a soft cloth.

Do not use solvents (such as benzine or thinner) or commercially available cleaners or anti-static sprays intended for audio discs.

After playing, store the disc in its case.

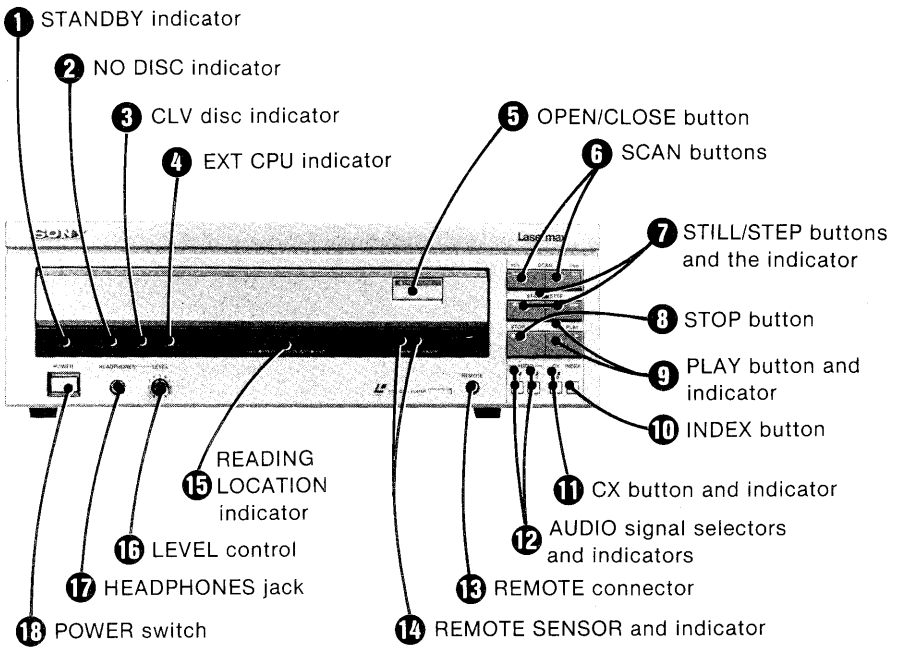
Use NTSC video discs

This player is to be used exclusively with the NTSC color system. PAL and SECAM video discs cannot be used in this player.

- CED and VHD type video discs cannot be used in this player.

1-6. PARTS IDENTIFICATION

FRONT PANEL



❶ STANDBY indicator
Lights up when a video disc is correctly placed in its tray. It goes off when the rotational speed of the video disc reaches the nominal value: this indicates that the playback can start any time.
If the compartment is pushed in forcibly, the indicator blinks to warn that correct operation cannot be obtained. In this case, press the OPEN/CLOSE button.

❷ NO DISC indicator
Lights when there is no disc placed in the disc compartment.

❸ CLV disc indicator
Lights when a CLV disc is being played back. The absence of the light indicates that a CAV disc is in place.

❹ EXT CPU indicator
Lights when the player is controlled by an external CPU through the RS-232C interface connector (or IEEE-488 interface bus for the player with the DB-2020 installed). In this mode the function buttons (SCAN, STILL/STEP, PLAY, STOP, INDEX, AUDIO and CX) on the player and the remote control unit (optional) become inactive. The videodisc player will respond to external computer (CPU) commands automatically when an external computer is connected to the RS-232C interface connector (or IEEE-488 interface bus for the player with the DB-2020 installed). In this mode, the DSR (Data Set Ready) line is active when the RS-232C line is used, or the REN (Remote Enable) line is active for the IEEE-488. When both lines are active, that of the IEEE-488 will be selected.

❺ OPEN/CLOSE button
Press to open the disc compartment. Press the button again to close it. Never push in the compartment.

❻ SCAN buttons
Keep one of these buttons depressed for high-speed playback (about 100 times normal speed). The ⏩ button initiates scanning in the forward direction, and the ⏪ button in reverse. When the button is released, normal speed playback will be resumed.
With the chapter number displayed on the monitor screen, chapter stop at the beginning of the present chapter (when the ⏪ button is pressed) or at the beginning of the next chapter (when the ⏩ button is pressed) is possible. The player enters the still mode with a CAV disc, and the normal playback mode with a CLV disc.

❼ STILL/STEP buttons and the indicator (only for CAV discs)
Press this button for a still picture. If you press the button again and immediately release it, the next frame will then be displayed in the still mode. When you keep the button depressed, the picture will advance frame-by-frame.
The ⏯ button advances the picture in the forward direction, and the ⏮ button advances it in reverse.
In the still and step modes, the red indicator lights up.

❽ STOP button
Press this button to mute the picture from the player. No picture will be displayed on the monitor TV screen in the stop mode.

❾ PLAY button and indicator
Press this button for normal playback. During playback, the red indicator lights up.

❿ INDEX button
Press to display the operating mode, frame number and chapter number (if it is pre-recorded) on the monitor screen while playing a CAV disc. When a CLV disc is playing, the time elapsed since the beginning of the program will be displayed, and the chapter number will be displayed if it is pre-recorded. Press this button again to turn the display off.
For the player with the DB-2010 installed, the program operation using the "audio track control codes" is displayed in the lower index line.

⓫ CX button and indicator
To play back a video disc which employs the CX Noise Reduction System*, press the button to ON. The indicator will light. For normal video discs, press the button again to turn it OFF. When a video disc which includes a special code to activate the CX system automatically is played, this button is not effective, because the CX system is automatically turned on.

* CX Noise Reduction System
This system is employed to improve the signal-noise ratio and enlarge the dynamic range of audio signals recorded on video discs.

⑫ **AUDIO signal selectors and indicators**
Each video disc has two audio channels, channel 1 and 2. When the player is turned on, both channels are automatically on and the CH-1 and CH-2 indicators will light. To turn off one of these channels, press the corresponding selector. The corresponding indicator will go off. Press the button again to activate the channel.
For the player with the DB-2010 and the DB-2040 installed, when SFA sound is played back, both indicators will go off and the AUDIO signal selectors become ineffective. When SFA operation completes, the indicators will light again, just as they were before the SFA operation.

AUDIO signal selector	LINE OUT jacks (HEADPHONES jack)		TV connector
	CH-1/L	CH-2/R	
CH-1 ON CH-2 ON	channel 1	channel 2	channel 1 and channel 2 mixed
CH-1 ON CH-2 OFF	channel 1	channel 1	channel 1
CH-1 OFF CH-2 ON	channel 2	channel 2	channel 2
CH-1 OFF CH-2 OFF	muted	muted	muted
SFA played back	SFA	SFA	SFA

⑬ **REMOTE connector**
This is a special mini jack for the optional RM-2001 remote control unit.

⑭ **REMOTE SENSOR and indicator**
The sensor located at the right receives the infrared signal from the RM-2001 remote control unit. When a command is detected, the red lamp located at the left blinks.

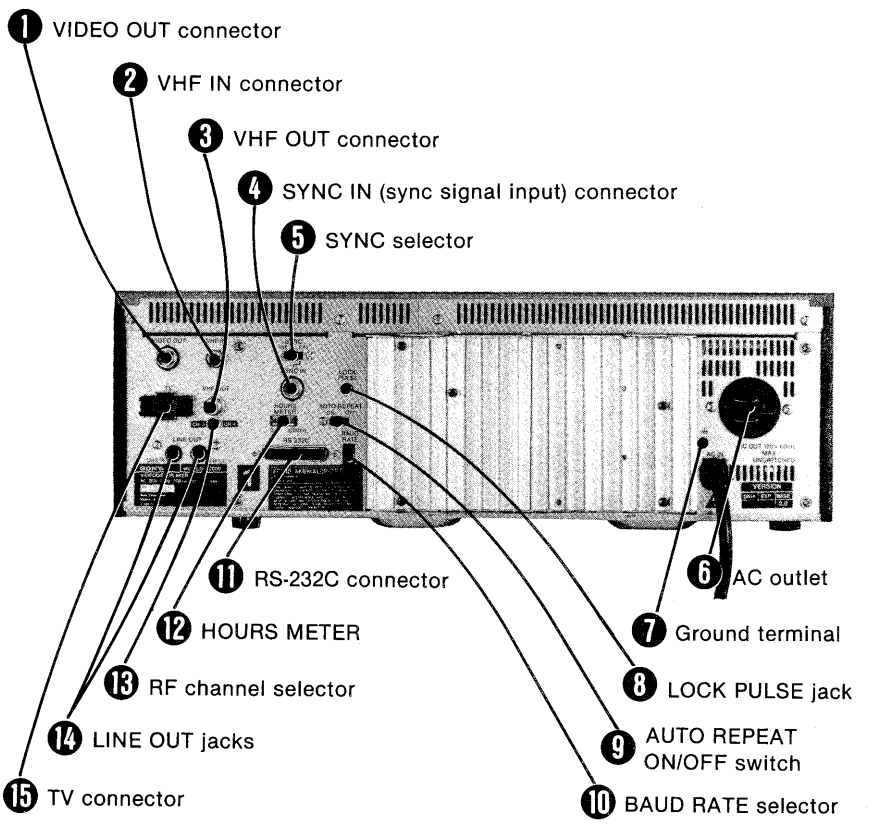
⑮ **READING LOCATION indicator**
Indicates the point on the disc which is being played back.
NOTE: The indicator point varies according to the environmental condition of the player or to a video disc used.

⑯ **LEVEL control**
Turn to adjust the headphones volume. Clockwise rotation increases the volume.

⑰ **HEADPHONES jack (Stereo phone jack)**
Connect headphones to monitor the audio. The headphones sound level is adjustable with the LEVEL control.

⑱ **POWER switch**
Press to turn on the power of the player. To turn it off, press the switch again.

REAR PANEL



❶ **VIDEO OUT connector**
A BNC connector for the output of the composite video signal.

❷ **VHF IN connector**
F-type connector for the RF signal input.

❸ **VHF OUT connector**
F-type connector for the RF signal* output.

* RF (Radio Frequency) signal : The built-in RF unit modulates the output signal of this player into the frequency of VHF channel 3 or 4, so that the picture from the disc can be displayed on the TV receiver.

❹ **SYNC IN (sync signal input) connector**
BNC type connector for the reference sync signal input. When the player's video signal is to be synchronized with an external sync signal, connect to the SYNC OUT connector of an external CPU or of an external sync generator.

❺ **SYNC selector**

Selects the signal with which the video circuit is to synchronize.

INT: Select this position when the unit is to be operated independently (synchronizing with its own sync signal) from other equipment.

EXT: Select this position when the signal input from the SYNC IN connector is to be used as the reference sync signal.

If no external sync signal is supplied to the SYNC IN connector, the player operates synchronizing with the internal sync signal regardless of the switch position.

❻ **AC outlet**

This outlet supplies ac power to other video equipment whose power consumption is no more than 300 watts. Power is always supplied to the connected equipment regardless of the power switch setting of the player.

❼ **Ground terminal**

To reduce hum, connect this terminal to an earth ground with a ground wire.

❽ **LOCK PULSE jack**

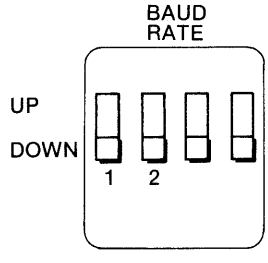
Special mini jack to supply the lock pulse signal to an external computer when superimposing video signals from the Sony SMC-70 microcomputer and the player using the optional video superimposer. The CPU's video signal is synchronized with the lock pulse signal from the player. As result, a stable superimposed picture can be obtained over the playback picture in the still, slow or fast mode of the player.

❾ **AUTO REPEAT ON/OFF switch**

Set the switch to ON (factory-preset position) to play back a video disc from the beginning to the end repeatedly. Set the switch to OFF not to repeat the playback of a video disc. The switch is ineffective when the player is controlled by the external CPU (EXT CPU indicator lit).

❿ **BAUD RATE selector**

Selects the speed of data transmission of the RS-232C line among the baud rate of 9,600, 4,800, 2,400, and 1,200 (bits/second). Set the selector to match the baud rate of the external CPU. The factory presetting is 1,200 baud.

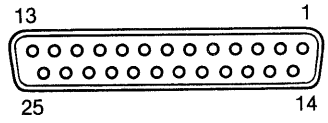


Switch setting		Baud rate
1	2	
DOWN	DOWN	1,200
DOWN	UP	2,400
UP	DOWN	4,800
UP	UP	9,600

⓫ RS-232C connector
25-pin RS-232C standard interface connector for communication with an external computer.
To connect to an external computer, refer to page 34.

Pin No.	Signal
1	FG (Frame ground)
2	TxD (Transmit data)
3	RxD (Receive data)
4 ┐	RTS (Reguest to send)
5 ← ┘	CTS (Clear to send)
6	DSR (Data set ready)
7	GND
20	DTR (Data terminal ready)

Pin assignment of the connector



Each signal conforms to the RS-232C specifications.
(Output level ON: more than +5 V, OFF: less than −5 V)

Note: Check the RS-232C pin assignment of the external computer to be connected. It differs among models.

⓬ HOURS METER
Indicates the accumulated time for which the player's power is on. Each segment shows 1,000 hours, up to a total of 10,000 hours.

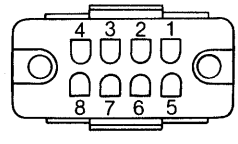
⓭ RF channel selector
Selects the channel to which the output signal of the VHF OUT connector is fed. Set the selector to channel 3 or 4, whichever is not active in your area.

⓮ LINE OUT jacks
Phono jacks for audio signal outputs.
The L jack outputs channel 1 (CH-1), and the R jack channel 2 (CH-2).
For the player with the DB-2010 and the DB-2040 installed, the SFA signals are also provided from these connectors after being decoded by the DB-2040 Computer Data/SFA Board

⓯ TV connector
8-pin connector for video and audio signal outputs.
If your monitor TV has a connector of the same type, connect the cable (with the square 8-pin plugs) to this connector to supply the video and audio signals to the monitor TV with a single cable.

Pin No.	Signal	Pin No.	Signal
1	Audio	5	AUDIO (G)
2	Video	6	VIDEO (G)
3	NC	7	NC
4	NC	8	NC

Pin assignment of the connector

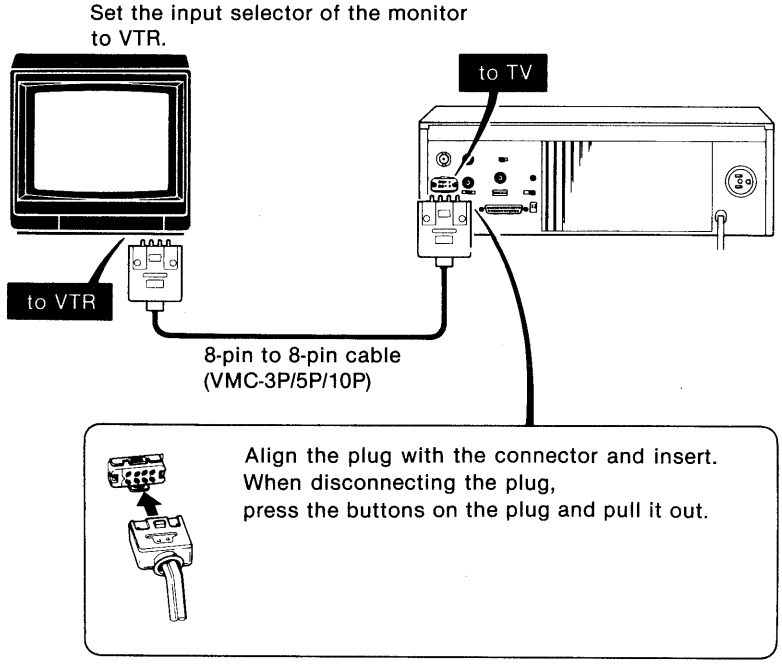


1-7. CONNECTIONS

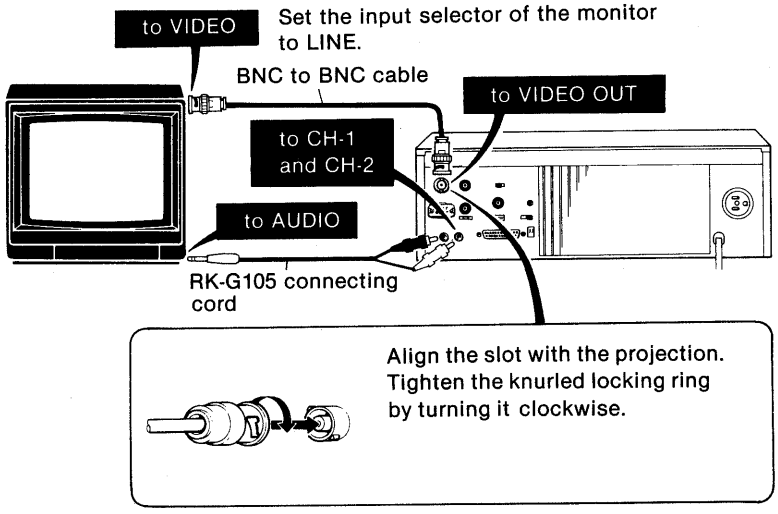
CONNECTION WITH A VIDEO MONITOR

If your monitor has an 8-pin VTR connector, video and audio signals can be connected with a single cable. If the monitor is not equipped with an 8-pin connector, use a BNC-BNC coaxial cable for the video signal connection and a cable with phono plugs for the audio signal connection.

When the monitor is equipped with an 8-pin connector


Set the input selector of the monitor to VTR.
to TV
to VTR
8-pin to 8-pin cable
(VMC-3P/5P/10P)
Align the plug with the connector and insert.
When disconnecting the plug,
press the buttons on the plug and pull it out.

When the monitor is not equipped with an 8-pin connector


to VIDEO
Set the input selector of the monitor to LINE.
BNC to BNC cable
to VIDEO OUT
to CH-1 and CH-2
to AUDIO
RK-G105 connecting cord
Align the slot with the projection.
Tighten the knurled locking ring by turning it clockwise.

- To play back the audio on a stereo system, connect the LINE OUT connectors to the auxiliary (or tape or tuner) inputs of the amplifier.
- Use the red plug of the audio cable for the right channel (R) connection.

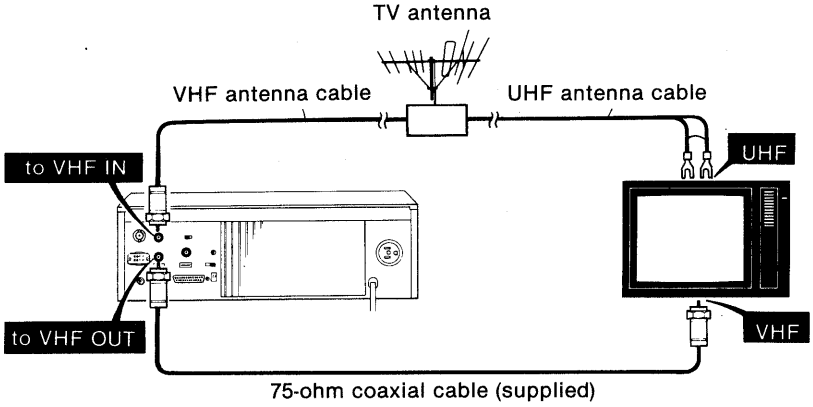
CONNECTION WITH A CONVENTIONAL TV RECEIVER

Antenna connection

Remove the VHF antenna lead from the TV receiver and connect it to the player. Then connect the VHF OUT connector of this player to the VHF antenna terminal of the receiver using a 75-ohm coaxial cable. Leave the UHF antenna cable connected to the TV receiver.

The VHF IN connector of this player is F-type. If your antenna cable is a 300-ohm ribbon type (flat cable), use the EAC-25 external antenna connector (optional).

When the player is turned on, the output signal of the VHF OUT connector is switched to supply the player signal. When the power is off, the antenna input signal coming from the VHF IN connector is supplied.



CAUTION
Connection between the player's VHF OUT connector and the antenna terminals of a TV receiver should be made only as shown in these instructions. Failure to do so may result in operation that violates the regulations of the Federal Communications Commission regarding the use and operation of RF devices. Never connect the output of the player to an antenna or make simultaneous (parallel) antenna and player connections at the antenna terminals of your receiver.

TV adjustment
When the connection is completed, adjust your TV receiver so that it can receive the signal from your player.

1. Set the RF channel selector located at the rear of the player to CH-3 or CH-4, whichever channel is not active in your area.
2. Make sure that an external CPU is not connected to the player.
3. Turn on the power of the player and set the player in the playback mode.
4. Turn on the TV.
5. Set the channel on the TV to the VHF channel 3 or 4, depending on the setting of the RF channel selector. The picture from the disc will be displayed on the TV screen.
   If a picture does not appear, or if the display is not clear, fine tune the channel, so that the picture is clearly displayed on the screen and the sound is clearly heard.

- For details on TV channel adjustment, see the instruction manual furnished with the TV receiver.

Now the TV receiver has been correctly tuned to receive the signal from the player. Select the channel adjusted in the above steps, whenever the video disc player is used.

1-8. OPERATION

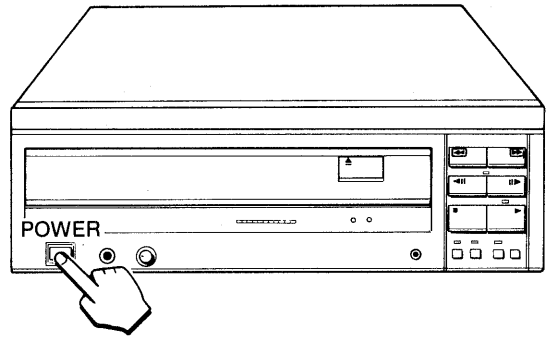
1-8-1. To Play Back a Video Disc

When the player is connected to an external computer, the player operation is entirely controlled by the external computer.
The following procedures explain in detail the operation of the player in the standalone mode. The operation is possible only when the player is not connected to an external computer (the EXT CPU indicator not lit). In this mode the optional RM-2001 remote control unit can be used and its operation is explained in the corresponding operating manual.

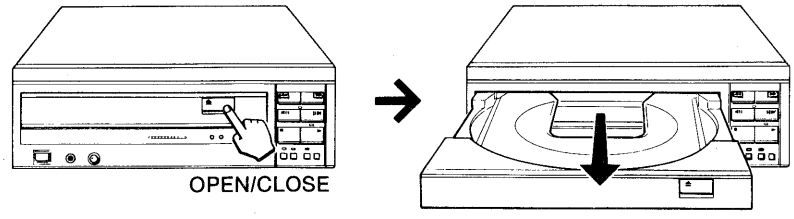
Before starting the operation, keep in mind the following precautions.

- To open and close the disc compartment, press the OPEN/CLOSE button. Never push or pull the compartment forcibly.
- Place a disc in the tray with the side to be played back facing down (with the label of the desired side up). Note that the laser reads from below.
- If a disc is not placed correctly in the tray or the disc has a defect which prevents normal playback, the disc compartrment will be ejected as soon as the defect is encountered.

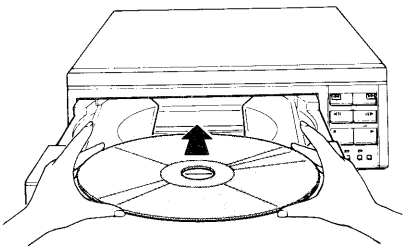
1. Turn on the power of the video disc player by depressing the POWER switch.



2. Press the OPEN/CLOSE button. The disc compartment comes out automatically.



3. Place the disc with the desired program label facing up.



Place in the indentation.

4. Press the OPEN/CLOSE button again. The compartment moves back into the cabinet. The disc starts rotating and the STANDBY lamp will light up for several seconds. When the lamp goes off, playback will start automatically.

To stop the playback
Press the STOP button. The monitor screen will be muted.
If any function button is pressed, the player will start playing in the corresponding mode from the point at which the STOP button has been pressed.

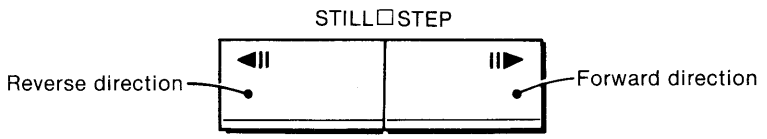
To remove the disc
Press the OPEN/CLOSE button to stop the playing of the disc, no matter what mode the player is in.
The disc will stop rotating, and the disc compartment will be ejected.

Note
At the beginning of the playback, the picture may be distorted. This symptom tends to occur especially when a CLV disc is used or the player is operated in the external sync mode.

1-8-2. Various Playback Modes

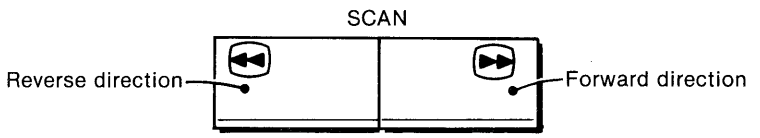
STILL/STEP PLAYBACK (CAV disc only)

Press either of the STILL/STEP buttons. This freezes the picture being displayed.
To advance the picture frame-by-frame, press one of the STILL/STEP buttons. The ⏭ button advances the picture in the forward direction, and the ⏮ button advances it in reverse. If you keep the button pressed, the picture advances frame-by-frame repeatedly. To stop the picture, release the button. A still picture will be displayed.



HIGH SPEED PLAYBACK (CAV and CLV)

Keep one of the SCAN buttons pressed. The ⏩ button quickly advances the picture in the forward direction and the ⏪ button advances it in reverse. When you release the button, normal playback will be resumed.



Note: The picture of a CLV disc may be distorted in this mode.

CHAPTER STOP (CAV or CLV disc with chapter codes)

Display the chapter number by pressing the INDEX button and then press either of the SCAN buttons.
The ⏩ button locates the beginning of the next chapter and the ⏪ button locates the beginning of the chapter being played back. When the chapter stop activates, the still mode is obtained with a CAV disc and normal playback will be resumed with a CLV disc. If you want to continue the SCAN mode, keep the button again.

1-8-3. Search and Repeat Operations

Search and repeat operations are activated by the respective commands from an external CPU or by operating the RM-2001 remote control unit. For detailed instructions, refer to the Interface Manual or to the RM-2001 operating instruction manual.

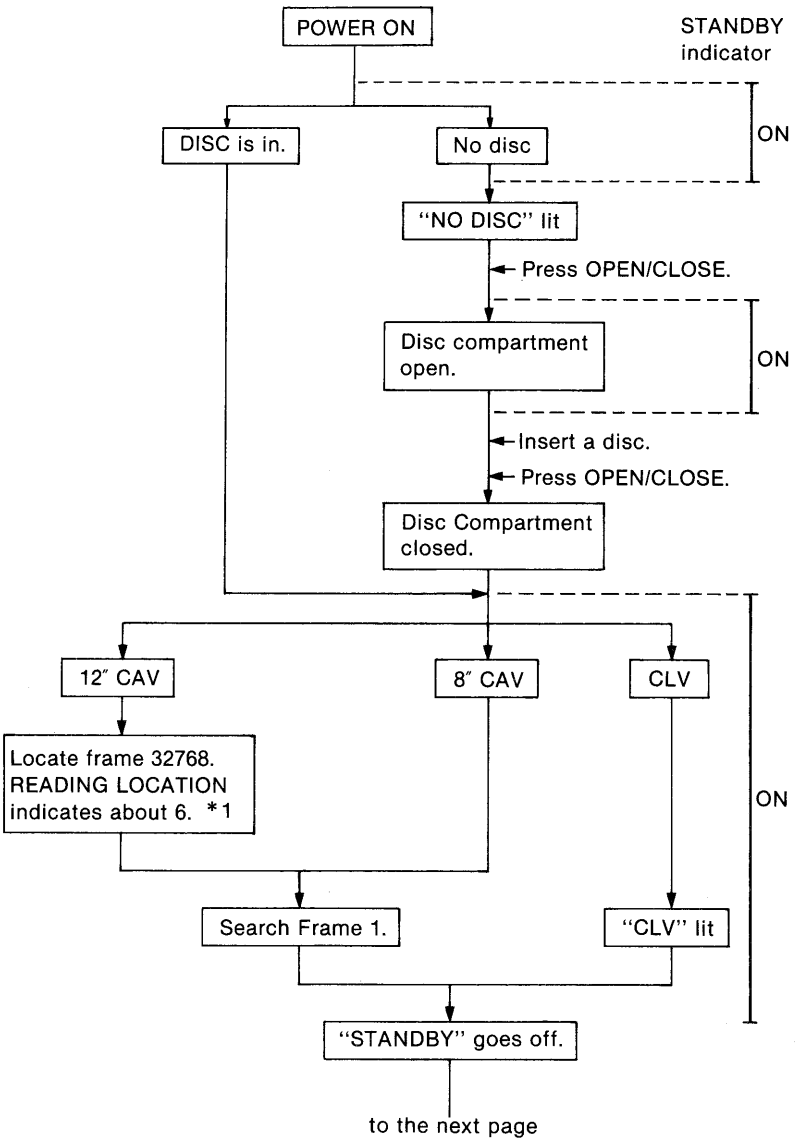
The use of these operations differ according to whether a video disc is CAV or CLV.

With **CAV** discs, enter the frame number. If the chapter number is prerecorded, the number can be used to perform a search and a repeat operation of the desired chapter on a disc. In the search operation, when a designated frame or the beginning of the chapter number is located, the player is automatically set to display the still picture. In the repeat operation, the desired playback mode can be obtained.
For the player with the DB-2010 installed, the search and repeat operation can be executed designating the segment number if a disc has segment numbers in the "audio track control codes" prerecorded on the audio channel 2 with the keys on the RM-2001 remote control unit.

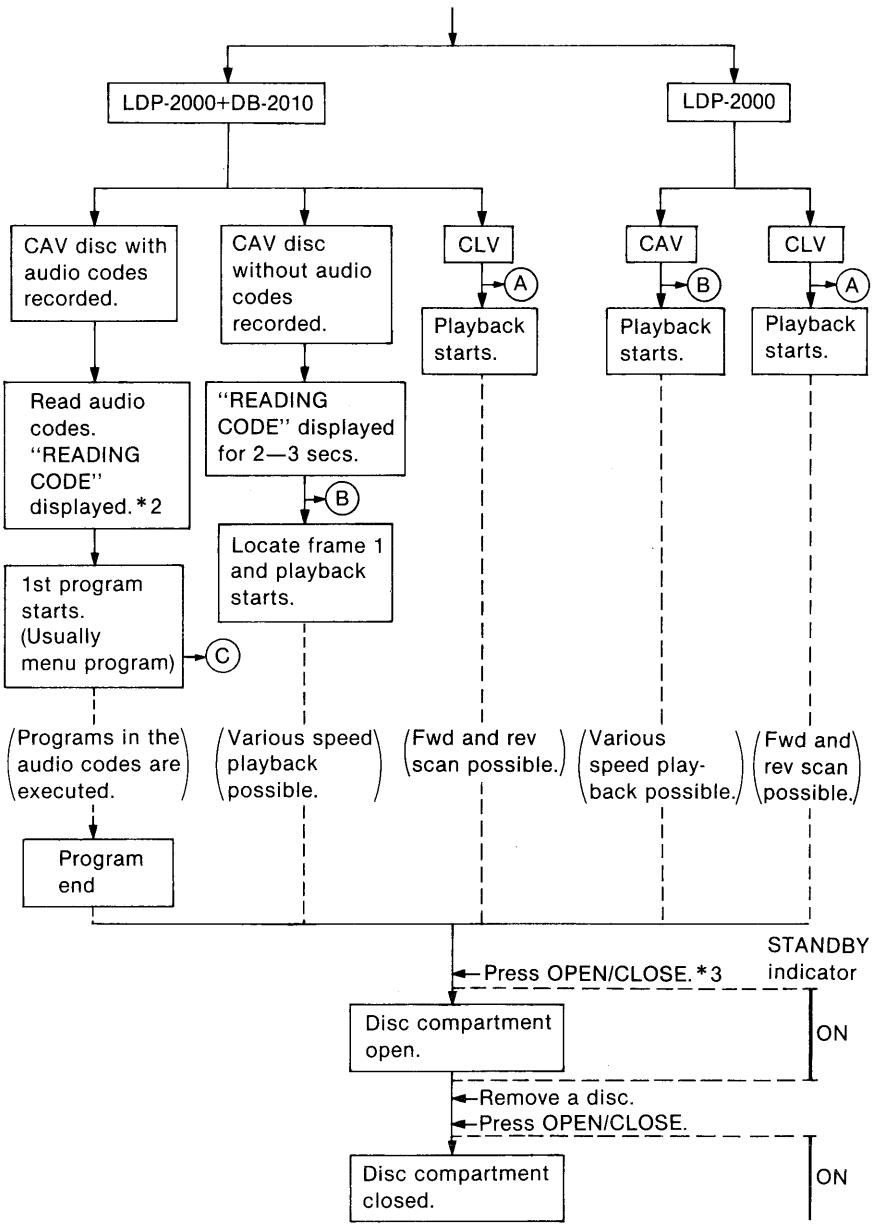
With **CLV** discs, enter the time number. If chapter numbers are prerecorded, these numbers can also be used. When the beginning of a designated time number (chapter) is located, the player is set to the normal playback mode.

Note
If you assign an invalid number to be searched, the search operation may continue about 10 seconds with a CAV disc or about 30 seconds with a CLV disc. The player will then enter the still mode with a CAV disc or the play mode with a CLV disc.
If the player, however, detects the lead-in or lead-out code after search operation of an invalid number is executed, the player activates in the same way as when the player detects the lead-in or lead-out code in normal operation. (See page 10.)

1-8-4. Flow Chart of Video Disc Playback



* 1 This is to compensate the pitch between the standard pitch and the actual pitch on the disc used. The search operation will be even quicker.
* 2 The INDEX mode is automatically set to OFF when the display appears on the screen.
* 3 The CX mode is automatically set to OFF at this point.



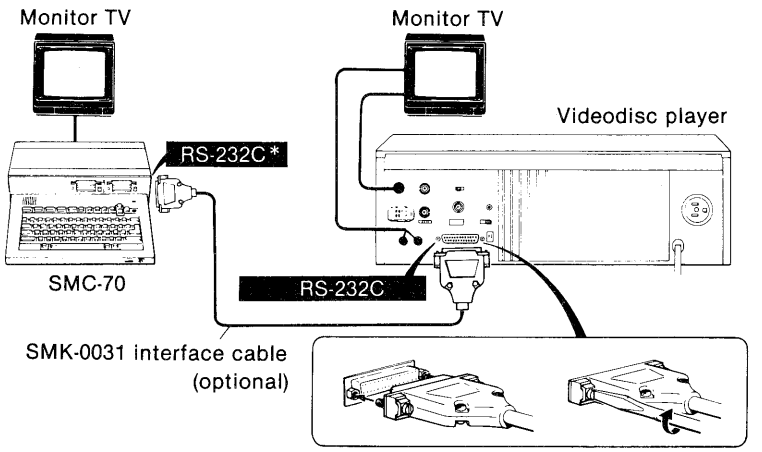
In EXT CPU mode

- (A) → The player is in stop mode at the beginning of time number and is ready to receive commands from an external CPU.
- (B) → The player is in still mode at frame 1 and is ready to receive commands from an external CPU.
- (C) → Operate according to the program of the audio track control codes.

1-8-5. Connection with an External Computer

TO CONTROL THE PLAYER WITH SONY SMC-70 MICROCOMPUTER

This configuration shows a basic level of player control by the computer. Additional commands for the player operation from an external CPU can be used with use of the DB-2010 Control Expansion Board. See the Interface Manual for details.



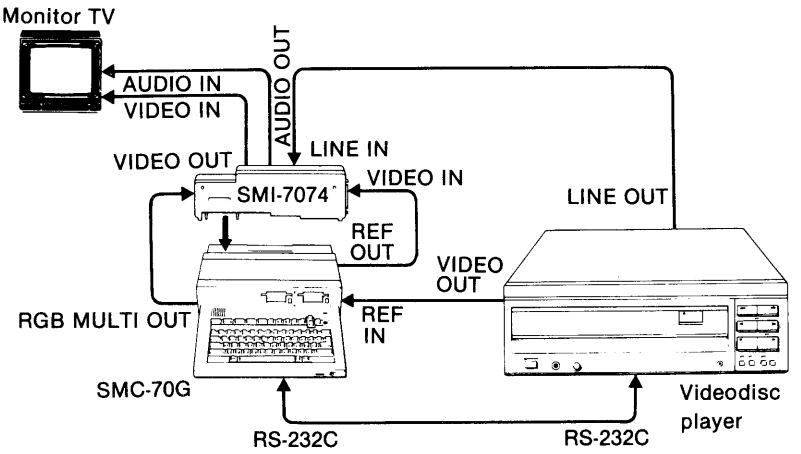
* The following settings of the RS-232C interface connector on the SMC-70 are required.
— Signal direction selector to "To TRMNL"
— Baud rate selector should be the same as the one selected on the video disc player. The baud rate of the player is factory-preset to 1,200 bauds.
— The CN-202 internal connector to "DSR signal" selection.

TO SYNTHESIZE THE PLAYER'S PICTURE AND THE MICROCOMPUTER'S PICTURE

With the combination of the Sony SMC-70G microcomputer and the SMI-7074 NTSC superimposer or SMI-7073 RGB superimposer, synthesized picture of the videodisc player and the microcomputer can be obtained.

When the SMC-70G is used, the genlock function of the microcomputer synchronizes the computer's output signal to the player's signal and outputs the synthesized signal to the monitor.
The SMI-7074 NTSC superimposer synthesizes the picture of the SMC-70G microcomputer and the player, converts it to an NTSC signal and outputs it to a monitor.
The SMI-7073 RGB superimposer synthesizes the picture of the SMC-70G microcomputer and the player on the monitor. (The monitor should be equipped with the function of superimposition.)

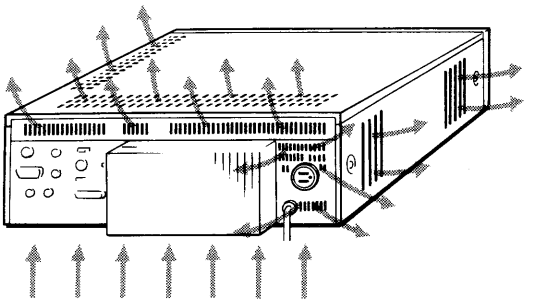
Example: Using the SMC-70G and the SMI-7074 NTSC superimposer



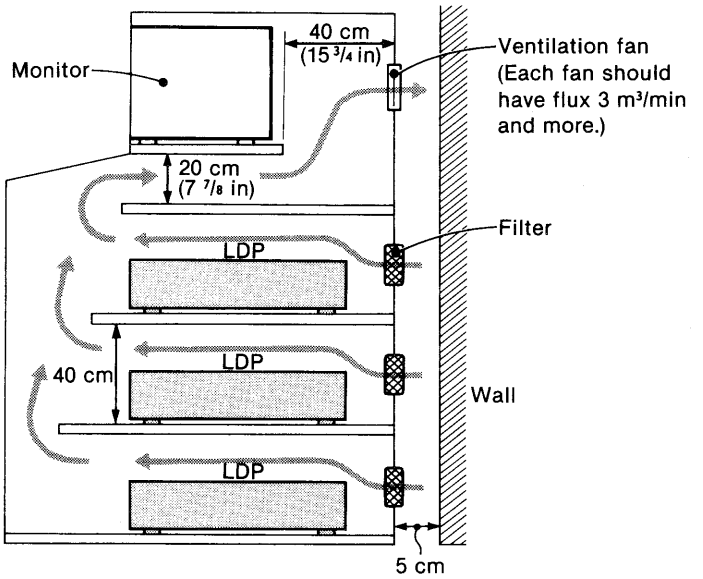
1-9. NOTE FOR INSTALLING THE PLAYER IN A RACK

When the videodisc player(s) is(are) installed in a rack, special consideration should be taken to prevent internal heat buildup.

Ventilation holes on the LDP-2000 series



Recommended ventilation when installed in a rack



- The air in the rack should be circulated from the bottom to the top as indicated.
- The temperature in the rack should not be over 35°C (95°F).
- Allow at least 5 cm (2 inches) behind the rack when installing it against the wall.
- The distance between each shelf should be at least 40 cm (12 3/4 inches)
- The holes located at the back of the rack should have filters to prevent dust from being drawn into the rack.
- At least two ventilation fans should be used and should be installed in the back of the rack as indicated in the figure.
- If a monitor is installed in the same rack, care should be taken to prevent the heat from the monitor affecting the players.

Note

When the player is used in a dusty place, powdery dust will be drawn in the player and contaminate the objective lens in the optical pick-up system.

1-10. TROUBLE CHECKS

Many apparent malfunctions may be caused by a misoperation or an oversight. If any difficulty arises in operation, check through this list of symptoms and causes.

- The following list includes troubles when the RM-2001 optional remote control unit is used.

Symptom	Cause
Power is not turned on.	• Power cord is not connected. • Power has been turned on and off repeatedly and the protection circuit activates. Wait one minute to turn the power on again.
The disc compartment is ejected automtically.	• The video disc is not placed correctly on the tray. • The video disc has scratches or dirt on the surface. • The side of a video disc to be played back is placed facing up. The side to be played back should be placed facing down.
The disc compartment cannot be ejected.	• Power is not turned on. • During 2 seconds after the power is turned on, the OPEN/CLOSE button does not activate.
The PLAY button does not activate.	• An external computer is connected to the player. • The STANDBY indicator lights up. Wait until the indicator goes off. • The STANDBY indicator blinks. Press the OPEN/CLOSE button. • The SEARCH or REPEAT button on the RM-2001 has been pressed when the picture is muted by the STOP button. Clear the search or repeat mode with the CL button or continue the search or repeat operation to the end.

Picture is not displayed, although the PLAY indicator lights.	• The monitor TV is not turned on. • The connection of the monitor TV (or TV receiver) is not correct. • The input select of the monitor TV is not set correctly. • The disc is placed in the table with the side to be played back facing up.
Picture quality is bad.	• Connection of the monitor TV (or TV receiver) is not correct. • An equipment is near the player to transmit noise and affect the picture quality of the video disc. • The disc to be played back has a scratch or dirt on the surface. • There is moisture condensation in the videodisc player. • The RF channel selector setting does not correspond to the channel selected on the TV. • TV fine tuning has not been adjusted correctly.
No audio	• The speaker system or TV monitor is not connected correctly. • The volume setting of the amplifier or TV monitor is too low. • Audio is muted in the modes except for the normal playback.
Particular part of a video disc is not played back correctly.	• The disc has a scratch or dirt on that part. Advance the picture rapidly by pressing the SCAN button.
Particular part of a video disc cannot be found in search operation.	• The disc has a scratch or dirt on that part. Change with another video disc.

The RM-2001 remote control unit does not operate.	• The batteries are exhausted. • When used as wired, the unit is not connect to the REMOTE connector firmly. • When used as wireless, the unit is not pointed to the REMOTE SENSOR properly, or there is an obstacle between the unit and the REMOTE SENSOR. • An external computer is connected to the player.
The picture is muted and the PLAY or STILL indicator is not lit.	• The STOP button is activated. • The search operation is being executed. If the assigned number to be searched is invalid or not found because of the defect of a disc, the player is in search mode for 10 seconds with a CAV disc and 30 seconds with a CLV disc. • The playback goes to the end of a disc and stops when the AUTO REPEAT switch at the rear is set to OFF.
Fast (×3) speed, still/step and reverse playback is not possible.	• A CLV disc is used.
STANDBY indicator does not light when the power is turned on.	• The power is turned on within 5 seconds after the power is turned off. The indicator will light after the motor speed is resumed. • The power is turned off before the disc compartment is closed fully. Press the OPEN/CLOSE button again.

1-11. OPTIONAL BOARDS FOR THE SYSTEM-EXPANSION

1-11-1. Specifications

DB-2010

Audio track control code

Data recording	Audio channel 2
Program steps	512 max. (1 dump)
Segment number	1 to 63 (1 dump)
Programs to be executed	7 dumps (7 x 1 K bytes) max.

Connectors

LDP-2000 interface	40 pin
DB-2020 interface	26 pin
DB-2040/2030 interface	50 pin

General

Dimensions	Approx. 94 × 10 × 292 mm (W/H/D) ($3\frac{3}{4} \times \frac{7}{16} \times 11\frac{1}{2}$ inches)
Weight	Approx. 300 g (11 oz)

DB-2020

Total cable length	20 m (66 ft) max.
Cable length between devices	5 m (16.5 ft) max.
Number of connectable devices	15 max.
Transfer mode	3-cable handshaking
Transfer rate	500 K byte/sec max.
Data transfer method	8-bit parallel
Signal lines	Data lines DI01 to DI08: 8 Control lines: 8 Handshake lines: DAV, NRFD, and NDAC Control lines: ATN, REN, IFC, SRQ, and EOI Signal/system ground lines: 8
Signal logic	Negative

General

DB-2010 interface	26-pin
IEEE-488 interface connector	24-pin
Dimensions	Approx. 175 × 24 × 52 mm (W/H/D) ($7 \times 1 \times 2\frac{1}{8}$ inches)
Weight	Approx. 130 g (5 oz)

DB-2040

Digital data

Capacity	Bytes/sector: 4096 Sector/frame: 1 Bytes/disc: 220M (max.)
ECC system	CIRC (Cross Interleave Reed-solomon Code)
Transfer rate	100K bytes/sec. (Time required to read data on a disc and transfer it to an external CPU by DB-2040)

SFA

1 SFA unit	Audio data: 32 frames Black burst: 4 frames Still picture: 3 frames
Playback time	2 (2 frames) to 40 (32 frames) sec./SFA unit Total: 16 hours/disc
S/N	More than 52 dB
Frequency response	40 Hz to 3500 Hz
Output level	Variable 0 dB (SFA volume at center position) 6 dB (at max.) at LDP-2000 line output

General

Dimensions	Approx. 215 × 10 × 297 mm (w/h/d) ($8^1/_2 \times {}^7/_{16} \times 11^3/_4$ inches)
Weight	Approx. 740 g (1 lb 10 oz)

Operating environment (common with three boards)

Operating temperature	5°C to 35°C (41°F to 95°F)
Operating humidity	25% to 80%
Storage temperature	−20°C to 60°C (−4°F to 140°F)

1-11-2. Functional Outline

DB-2010

Interface board for other optional boards
The LDP-2000 has more optional boards for system expansion. The DB-2010 contains the connectors for other boards, DB-2020 parallel interface board, DB-2040 computer data/SFA board and DB-2030 SFA board. The DB-2010 has also resident on it the control programs for these optional boards. The appropriate control program will be activated when such boards are connected to the DB-2010.

Expanded performance of the RS-232C interface connector
With this board installed, the commands, which the RS-232C interface can handle, are expanded. The added commands are those related to the "audio track control codes" described as follows.

Program operation using "audio track control codes"
The LDP-2000 with this board installed is capable of playing video discs with "audio track control codes" recorded on the audio track (channel 2) at the inner part of a disc. The "audio track control codes" are composed of segment data*1 and program data*2 This type of video disc is suitable for interactive playback use.
When a video disc which contains "audio track control codes" is played back, the player reads the codes (while reading, "READING CODE" is displayed on the monitor), and stores them in the expansion board RAM. The playback starts automatically according to the program included. The command operation of discs is executed using an optional RM-2001 remote control unit or an external computer.
By connecting an external computer to the player, segment data or program data can be created and dumped on the expansion board RAM using a disc with or without "audio track control codes" already recorded.

*1 **Segment data**
Using the frame numbers on a CAV disc, the disc can be divided into up to 63 separate segments by designating the beginning and end frame of each sequence. Since the segment is composed of frames, speedy access in search and repeat operations is possible.

*2 **Program data**
A program example using "audio track control codes" is indicated on page 8. The program contains operations such as play, frame still, input command, etc. The "line" number in the program indicates the sequence in which the computer on the expansion board must process. The maximum line numbers are 512 (0 to 511) in each dump and up to 7 dumps can be programmed.

To execute programs using audio track control codes, refer to the operating manual of the RM-2001. To use with an external computer, refer to the interface manual of the LDP-2000 series.

DB-2020

The DB-2020 is the IEEE-488 standard interface bus for data communication between the videodisc player and an external computer. Its control program is included in the DB-2010 control expansion board (installed at the factory on the LDP-2100 and LDP-2200), to which this board should be connected.

Since this interface bus can execute data transmission in 8-bit parallel format between the player and the controller, high-speed data transfer is possible to allow smooth and speedy access of a video disc that has digital data or SFA data* recorded, when used with the DB-2040 computer data/SFA board.

*For digital data and SFA data, refer to the DB-2040 installation and operation manual. For details on the IEEE-488 interface bus, refer to the interface manual.

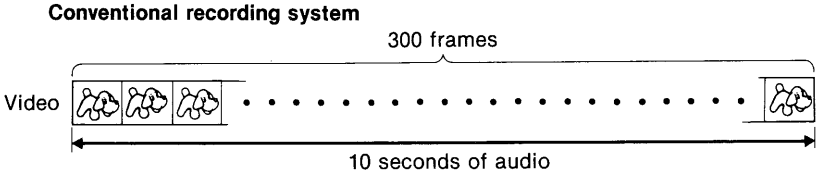
DB2040

The DB-2040 is the decoder for the digital data: SFA (Still Frame Audio)*1 and digital data for computer control*2. The SFA provides extended play of audio while still pictures are being displayed. The digital data for computer control provide wide computer-controlled application programs of a video disc.
The digital data access is managed by an external computer. The control program of the DB-2040 board is included in the DB-2010 control expansion board to which this board should be connected. For high-speed transfer of the digital data, the DB-2020 parallel interface board is available.

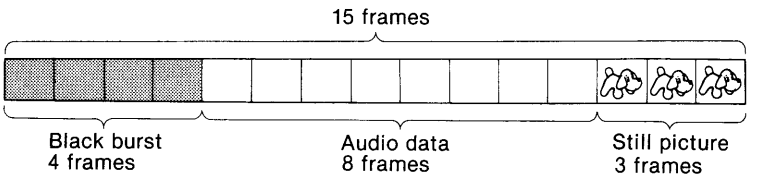
***1 SFA (Still Frame Audio) signal**
The SFA signal is an audio signal which is compressed and encoded into a digital signal.
In the conventional system, 300 frames are used to record 10 seconds of audio and only 30 minutes playback is possible with a whole disc. With the SFA signal, 15 frames are enough for 10 seconds of audio and many hours of playback become possible.
When the SFA signal is to be reproduced, its access from the disc is best managed totally by an external computer (host CPU). This allows for the videodisc player to play back the SFA in the proper blocks, matched with the proper images. For this kind of computer controlled system, a CAV disc must be used, because a CLV disc does not have the required frame numbers for access control.

The SFA data are recorded in blocks and one block consists of several frames. The length of a block is variable between 2 and 32 frames. At the beginning of the block, a special code, called a "header" is recorded and at the end, a code called a "trailer". Before the SFA data block starts, 4 frames of black burst signal are necessary to ensure correct operation, and 3 frames of still picture are added after the data block, if stills are used. (Step motion or computer graphics may also be displayed with the SFA if desired.)

Conventional recording system



SFA system (example of 1 SFA unit)

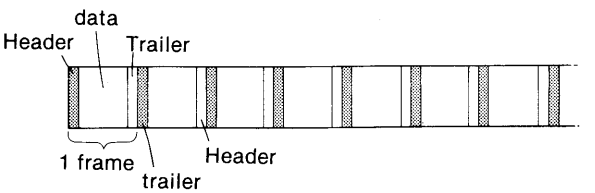


***2 Digital data for computer control**

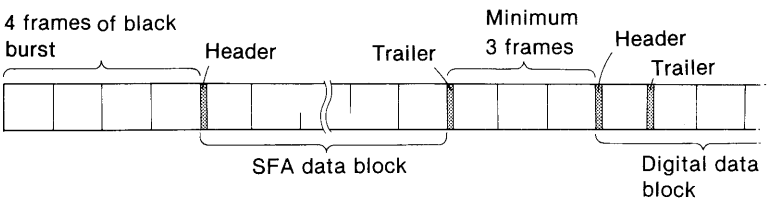
The digital data for computer control are also recorded on the video disc, but they do not produce any sound. The data is accessed by an external CPU connected through the IEEE-488 interface bus on the DB-2020.

The digital data are recorded in units of one frame and each frame has a header and a trailer. This allows the host CPU to obtain the data recorded on a single frame, in the same way as one would access a sector of a floppydisk. Up to 4K bytes of digital data can be recorded on a frame for a maximum 221M bytes of data on the entire disc.

A CAV disc is necessary to use digital data for computer control.



If the digital data for computer control are to be located next to the SFA data on a disc, more than 3 frames of black burst signal or video signal should be inserted between the SFA data block and the digital data block.



1-11-3. Precautions

- The board consists of high-precision electronic parts. Do not drop it or bump it against other objects.
- Do not touch the pins of devices on the board because static electricity may cause permanent damage to the board.
- Do not touch or adjust any part on the board, or correct operation cannot be obtained.
- Before making connections, turn off the player's power.
- Before turning on the player's power after the board is installed, make sure that the top panel of the player is repositioned firmly. If the top panel is not fixed correctly, the player's power will not be turned on.

Note on operation (DB-2010)

If a video disc has a scratch or dirt, the program operation of audio track control codes may not activate correctly.

Notes on playback of a disc with digital data (DB-2040)

- If disc operation is done manually, the digital data recorded on the video track is not always muted .
- If the playback is advanced intentionally while the SFA program is being executed, the SFA sound and the picture on the screen may not be synchronized for a predetermined duration.
- The SFA sound will be cleared when the OPEN/CLOSE operation is executed.
- If a video disc has a scratch or dirt, dropout or noise may occur in SFA playback sound.

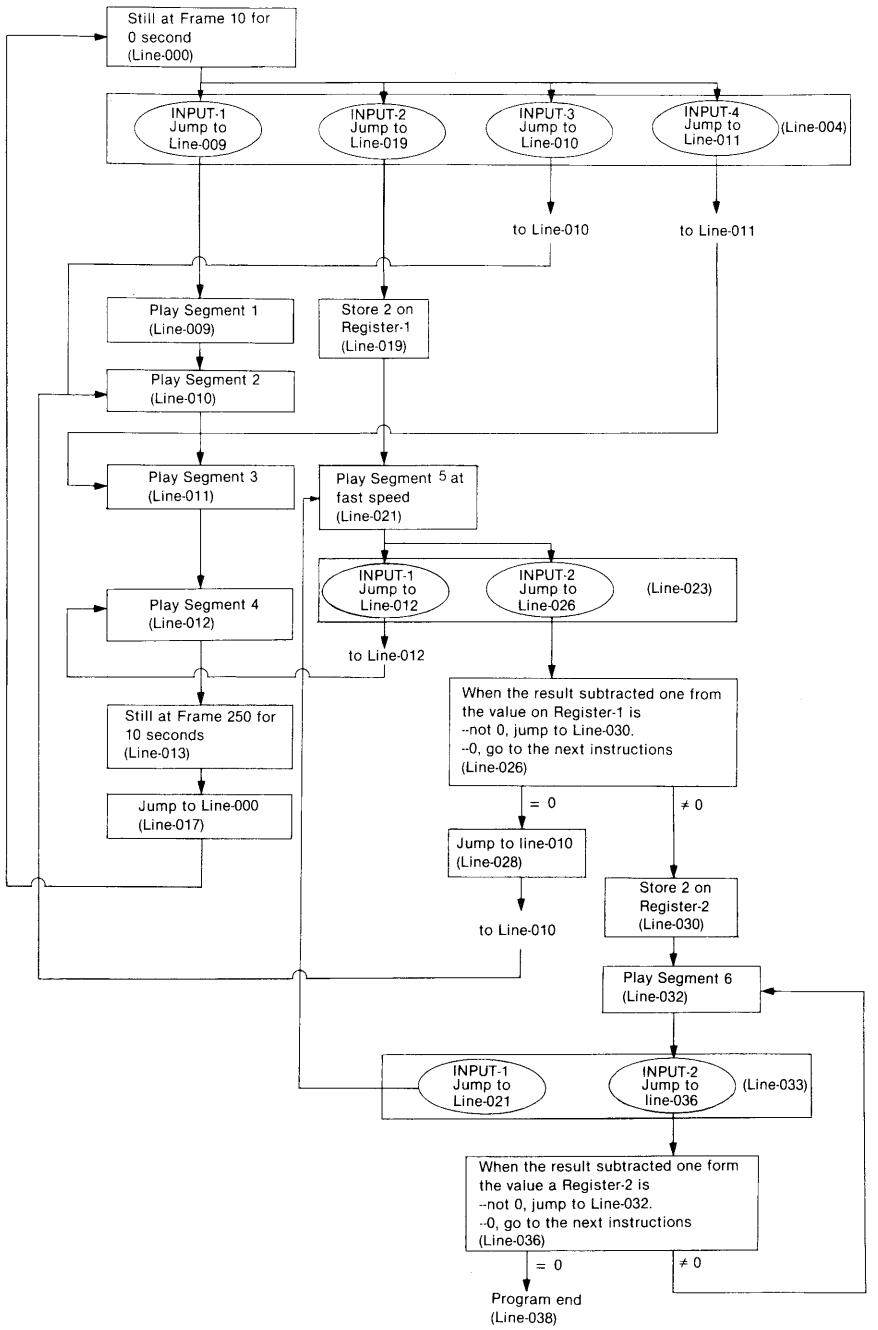
1-11-4. Location and Function of Controls

DB-2010

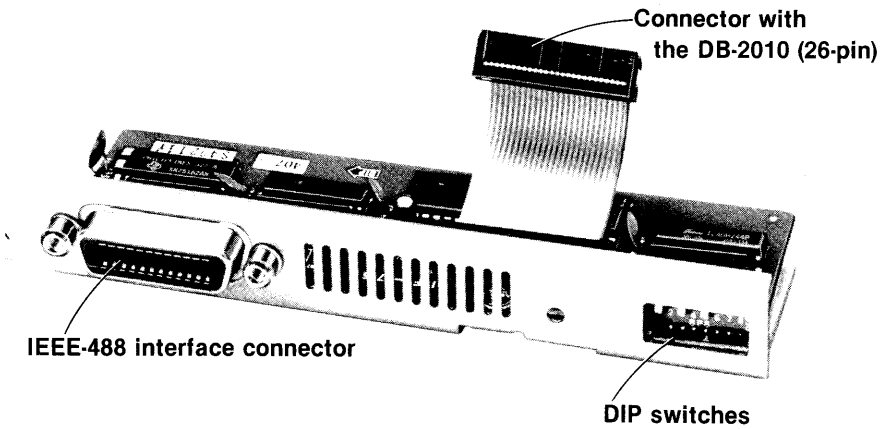
Example of Program Data

Line number	Instruction	Meaning of the instruction
000	STOP 00010	
	TIME 000	Still at Frame 10 for 0 second.
004	INPUT-1 009	Jump to Line 009 when [1] is pressed.
	INPUT-2 019	Jump to Line 019 when [2] is pressed.
	INPUT-3 010	Jump to Line 010 when [3] is pressed.
	INPUT-4 011	Jump to Line 011 when [4] is pressed.
009	S-001	Play Segment 1.
010	S-002	Play Segment 2.
011	S-003	Play Segment 3.
012	S-004	Play Segment 4.
013	STOP 00250	
	TIME 010	Still at Frame 250 for 10 seconds.
017	GO TO 000	Jump to Line 000
019	REG-1 002	"2" is stored on Register-1.
021	FAST S-005	Play Segment 5 at fast (x3) speed.
023	INPUT-1 012	Jump to Line 012 when [1] is pressed.
	INPUT-2 026	Jump to Line 026 when [2] is pressed.
026	REG-1 J 030	When the result subtracted one from the value on Register-1 is not 0, jump to Line 030; when it is 0, go to the next instructions.
028	GO TO 010	Jump to Line 010
030	REG-2 002	"2" is stored on Register-2.
032	S-006	Play Segment 6.
033	INPUT-1 021	Jump to Line 021 when [1] is pressed.
	INPUT-2 036	Jump to Line 036 when [2] is pressed.
036	REG-2 J 032	When the result subtracted one from the value on Register-2 is not 0, jump to Line 032; when it is 0, go to the next instructions.
038	End	Program end

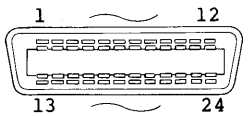
Flow chart of program operation


Still at Frame 10 for 0 second (Line-000)
INPUT-1 Jump to Line-009
INPUT-2 Jump to Line-019
INPUT-3 Jump to Line-010
INPUT-4 Jump to Line-011
(Line-004)
to Line-010
to Line-011
Play Segment 1 (Line-009)
Store 2 on Register-1 (Line-019)
Play Segment 2 (Line-010)
Play Segment 3 (Line-011)
Play Segment 5 at fast speed (Line-021)
INPUT-1 Jump to Line-012
INPUT-2 Jump to Line-026
(Line-023)
Play Segment 4 (Line-012)
to Line-012
When the result subtracted one from the value on Register-1 is
--not 0, jump to Line-030.
--0, go to the next instructions
(Line-026)
Still at Frame 250 for 10 seconds (Line-013)
Jump to Line-000 (Line-017)
= 0
≠ 0
Jump to line-010 (Line-028)
to Line-010
Store 2 on Register-2 (Line-030)
Play Segment 6 (Line-032)
INPUT-1 Jump to Line-021
INPUT-2 Jump to line-036
(Line-033)
When the result subtracted one form the value a Register-2 is
--not 0, jump to Line-032.
--0, go to the next instructions
(Line-036)
= 0
≠ 0
Program end (Line-038)

DB-2020

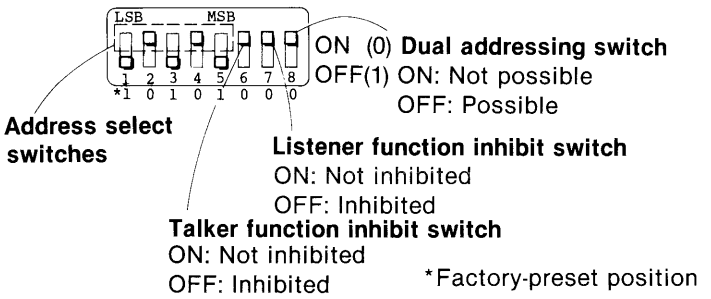


Pin assignment of the IEEE-488 interface connector



Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
1	DIO1	9	IFC	17	REN
2	DIO2	10	SRQ	18	GND
3	DIO3	11	ATN	19	GND
4	DIO4	12	SHIELD	20	GND
5	EOI	13	DIO5	21	GND
6	DAV	14	DIO6	22	GND
7	NRFD	15	DIO7	23	GND
8	NDAC	16	DIO8	24	GND

ADDRESS SWITCH SETTING



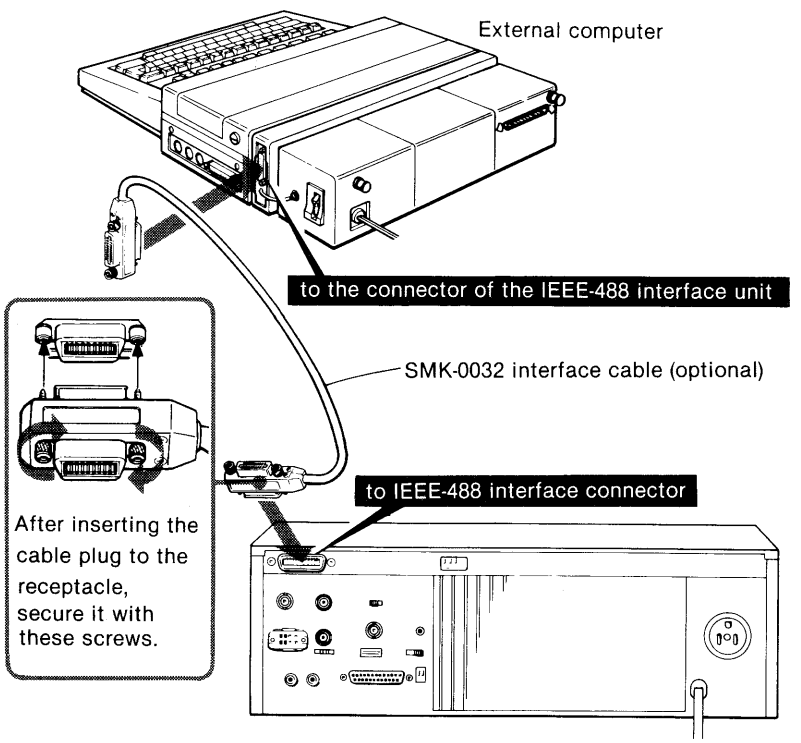
Address setting
Select the talker and listener addresses on the IEEE-488 interface bus within the range of 0-31(0H-1FH). Switch 5 corresponds to the most significant bit. Set a different address for each unit on the same interface bus. Set the switch to ON (upper position) for 0 and OFF (lower position) for 1.
The factory preset address is 21(15H). The actual listener address code on the interface bus is 35H, the sum of codes 15H and 20H, and the talker address code is 55H, the sum of codes 15H and 40H.

Inhibition of talker or listener functions
Switch 6 inhibits the talker function of the player and switch 7 inhibits the listener function.

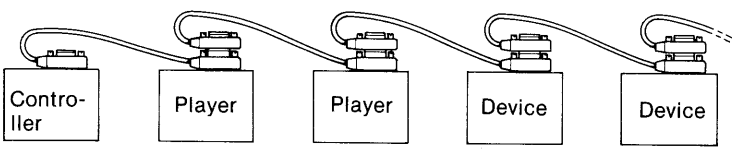
Dual addressing mode
Set switch 8 to OFF to select the dual addressing mode. The least significant bit of the address select switches is ignored, so that 2 contiguous adresses can be specified at one time.

CONNECTIONS

With an external computer or another player


External computer
to the connector of the IEEE-488 interface unit
SMK-0032 interface cable (optional)
to IEEE-488 interface connector
After inserting the cable plug to the receptacle, secure it with these screws.

Multiple connection example (example: one controller, two players and two other devices)



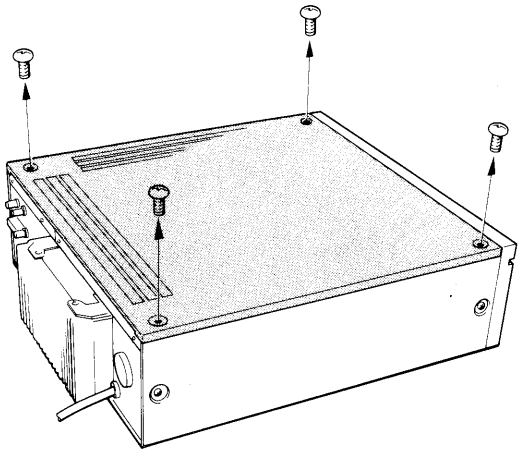
Note

Up to 15 devices can be connected on the same IEEE-488 interface bus. The cable length between two players must not exceed 5 meters. The total cable length must not exceed 20 meters.

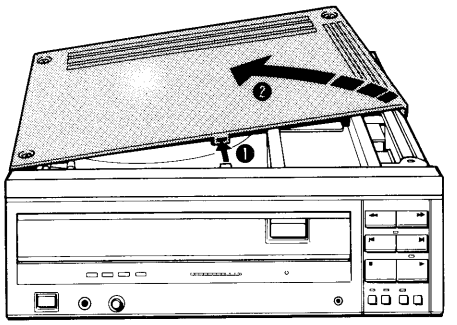
1-11-5. Mounting on the LDP-2000 Videodisc Player

- Make sure that the player's power is turned off before mounting the board.

1 Remove the four screws on the top panel.

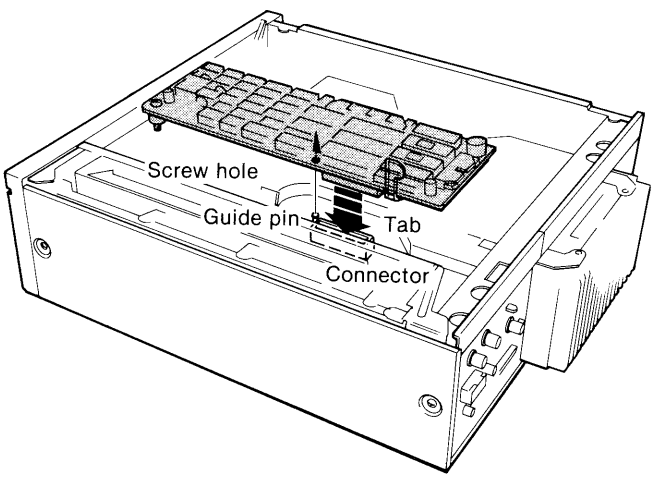


2 Holding the left corner by hand, unclasp the part ❶ and turn the panel in the direction of the arrow ❷.

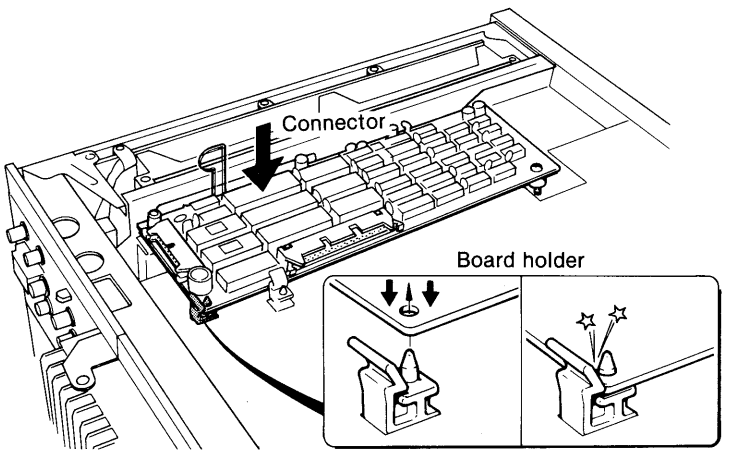


DB-2010

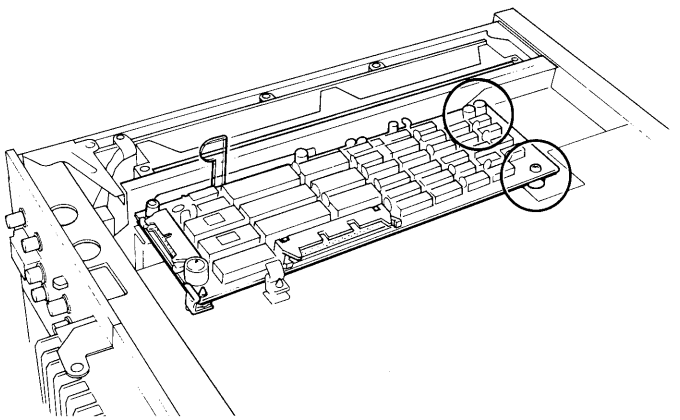
1 Mount and connect the board, aligning the guide pin and the screw hole. Insert the connector pins firmly. When removing the board by some reason, pull the tab out.



2 Secure the board by pressing down the connector part and the board holder at the corner.



3 Fasten it with the two screws.



4 Replace the top panel inserting the projection on the front panel into the corresponding hole on the top panel.

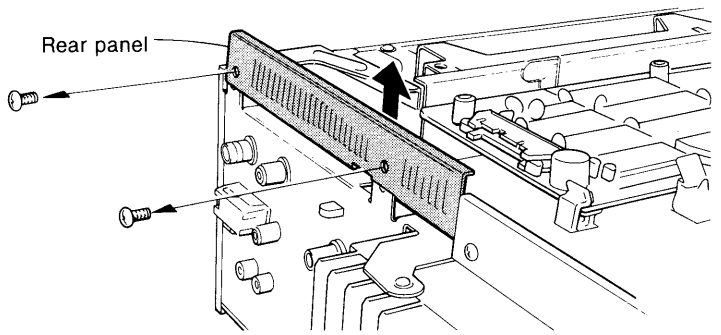
Note

Press down the connector part to connect the board surely.

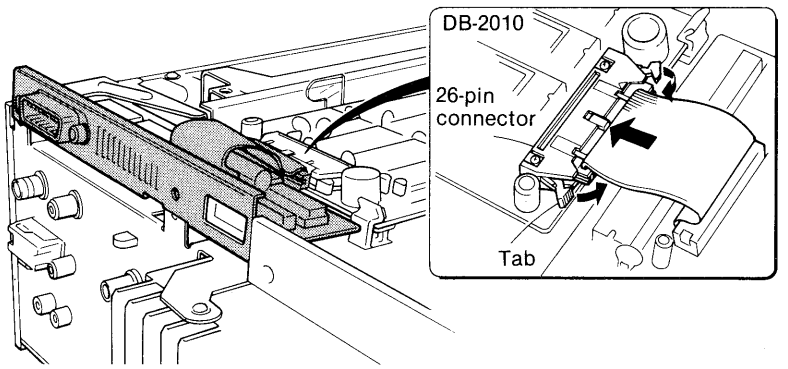
DB-2020

- The DB-2010 board should be installed first.

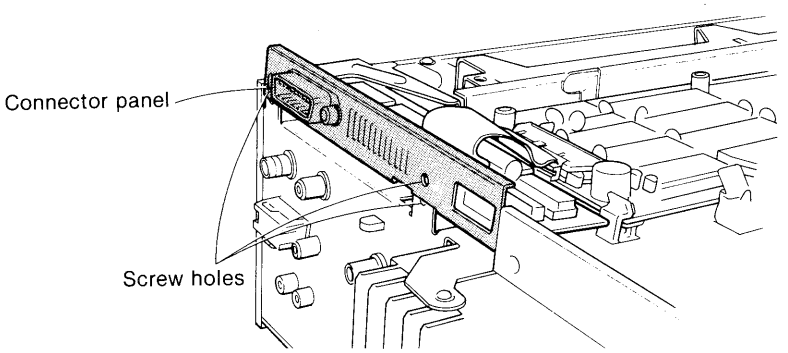
1 Take off the left panel by removing the two screws. These screws are used in the step 5.



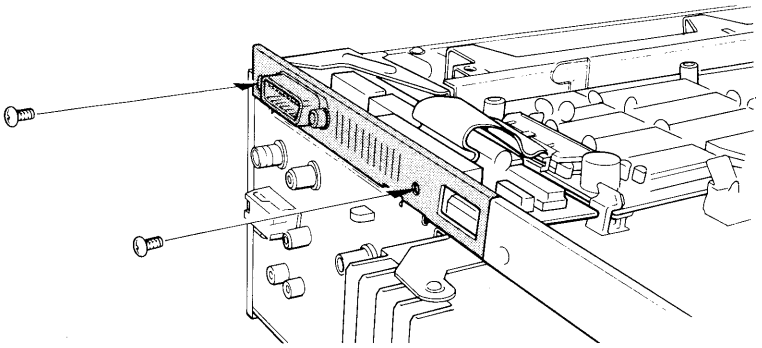
2 Insert the 26-pin connector of the board in the DB-2010 26-pin connector and lock the connection with the tabs on both sides.



3 Mount the board by aligning the screw holes so that the connector panel of the board is positioned where the rear panel was located.



4 Fasten the screws.

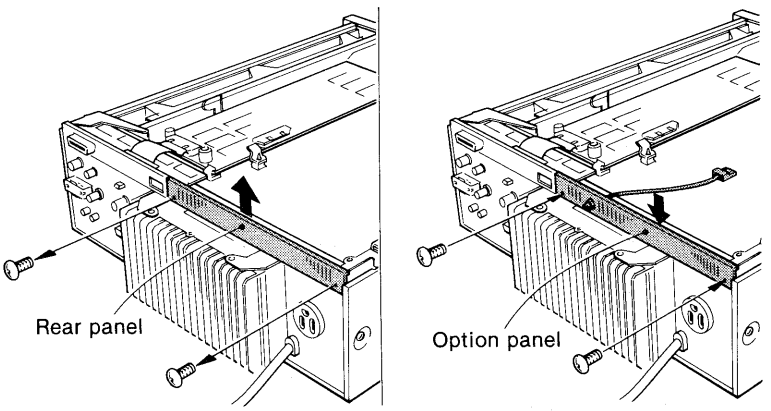


5 Replace the top panel inserting the projection on the front panel into the corresponding hole on the top panel.

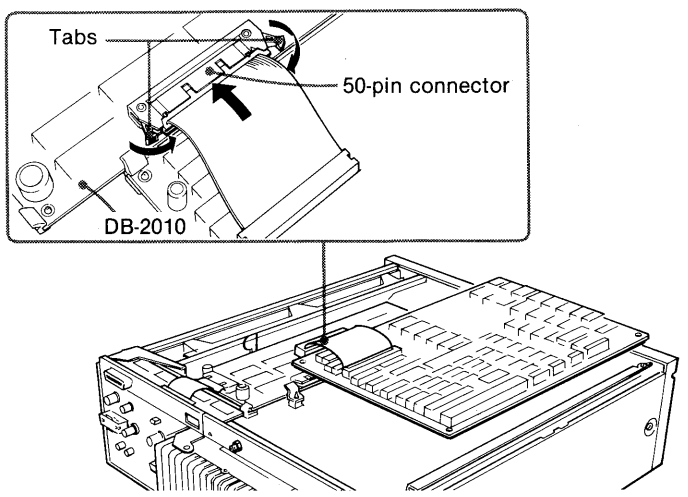
DB-2040

- Before installing the DB-2040, the DB-2010 control expansion board and the DB-2020 parallel interface board should have been mounted on the player.

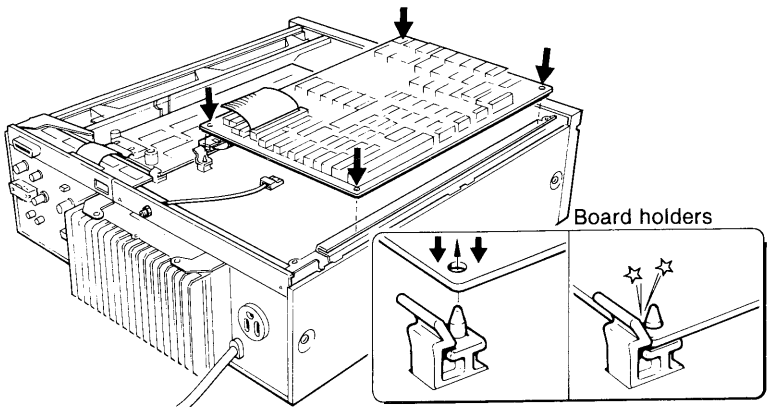
1 Take off the right panel by removing the two screws and attach the option panel in its place with the same screws.



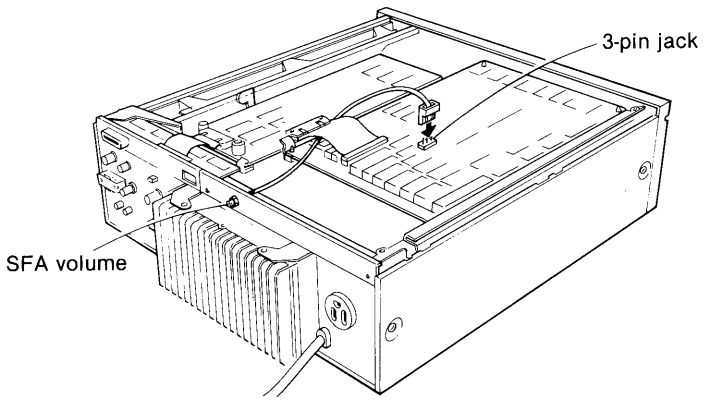
2 Insert the 50-pin connector of the board into the DB-2010 connector and lock the connection with the tabs.



3 Mount the board by aligning the board holders at each corner and press the board down.



4 Connect the cable from the SFA volume to the 3-pin jack on the board as illustrated.



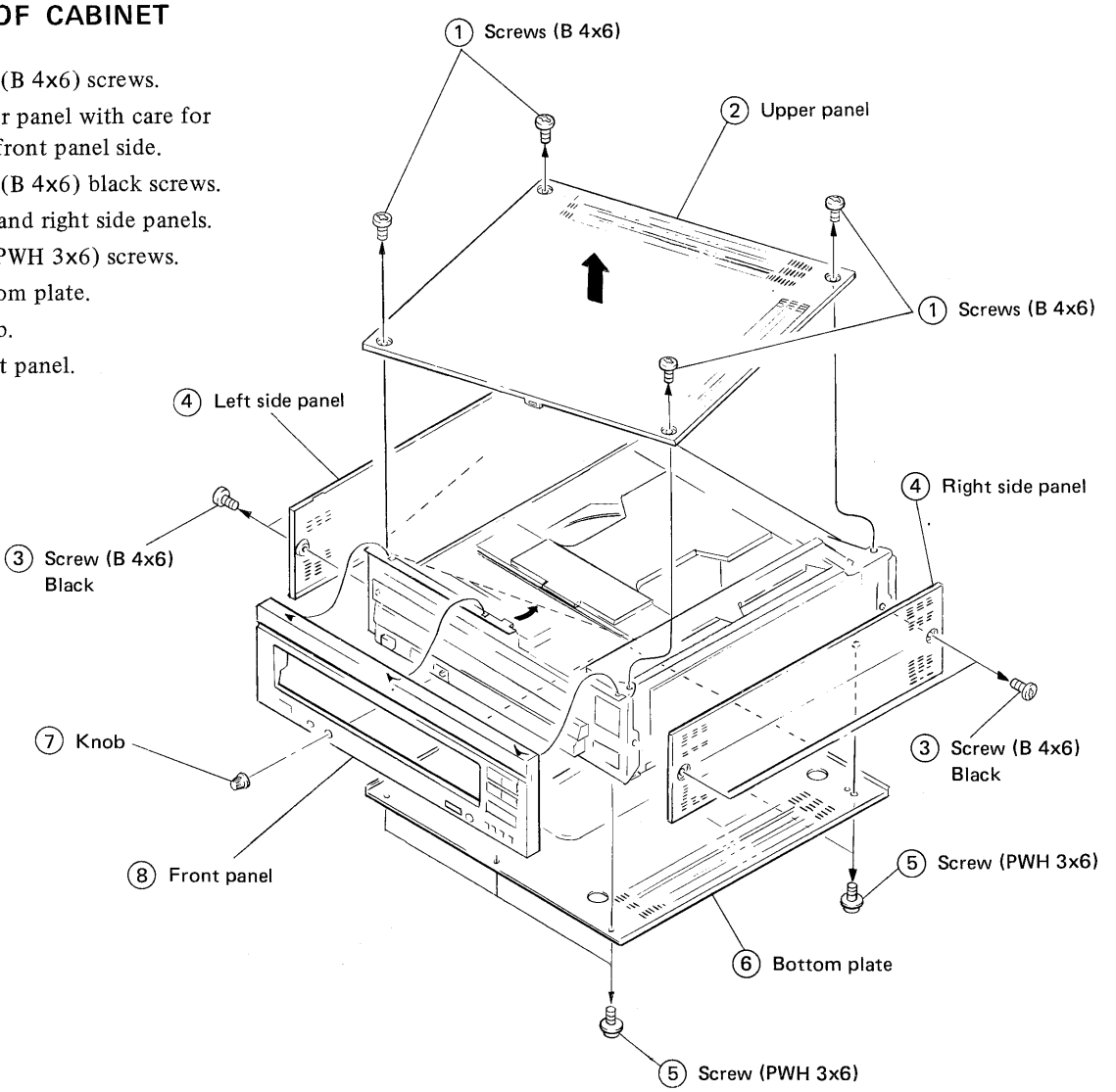
5 Replace the top panel inserting the projection on the front panel into the corresponding hole on the top panle.

SFA volume
Adjust the output level of the SFA playback sound to that of the palyer's normal playback sound.

SECTION 2
DISASSEMBLY

2-1. REMOVAL OF CABINET

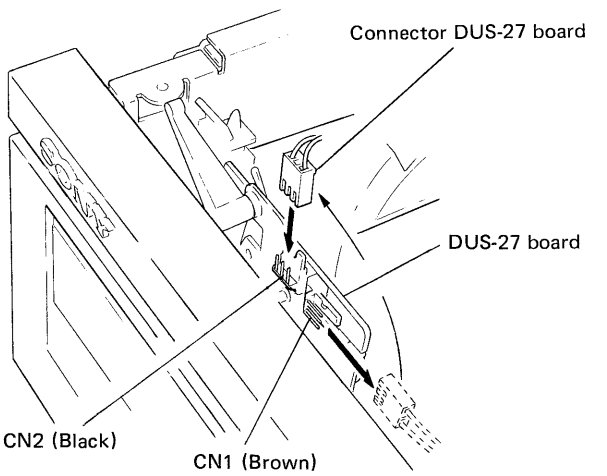
(1) Remove the four (B 4x6) screws.
(2) Remove the upper panel with care for the claws on the front panel side.
(3) Remove the four (B 4x6) black screws.
(4) Take off the left and right side panels.
(5) Remove the six (PWH 3x6) screws.
(6) Remove the bottom plate.
(7) Take off the knob.
(8) Take off the front panel.



2-2. FOR SET INSPECTION AND REPAIR

Once the upper panel is removed, the microswitch on the DUS-27 board works and the power supply for the set is not connected even if the POWER switch is turned on. When internal inspection and repair is required with the outer cabinet removed, the connector should be connected as shown in the figure. (Note that the connector should be as it was without fail before the cabinet is put on.)

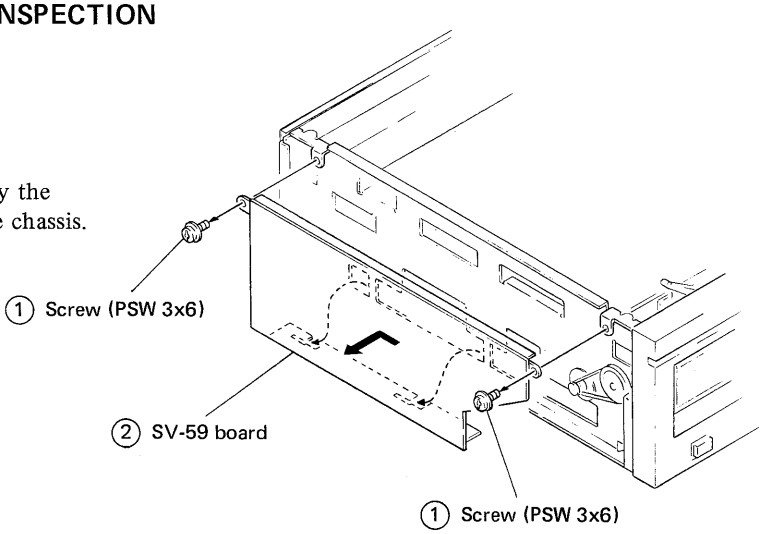
- Remove the connector on the DUS-27 board from CN1 (brown) and insert it into CN2 (black).



2-3. PRINTED CIRCUIT BOARD INSPECTION AND REPAIR

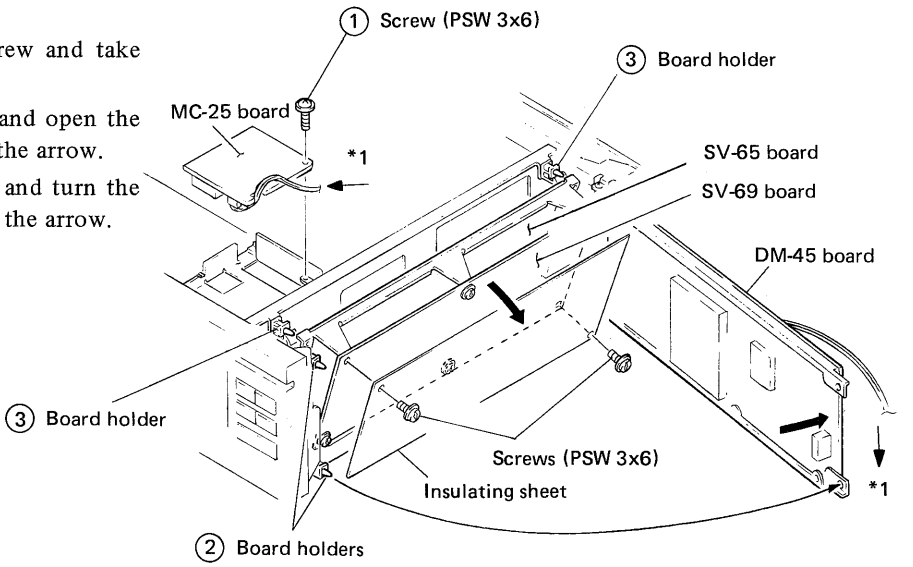
- **Removal of SV-59 Board**

(1) Remove the two (PSW 3x6) screws.
(2) Slide the board in the direction shown by the arrow and remove the heat sink from the chassis.



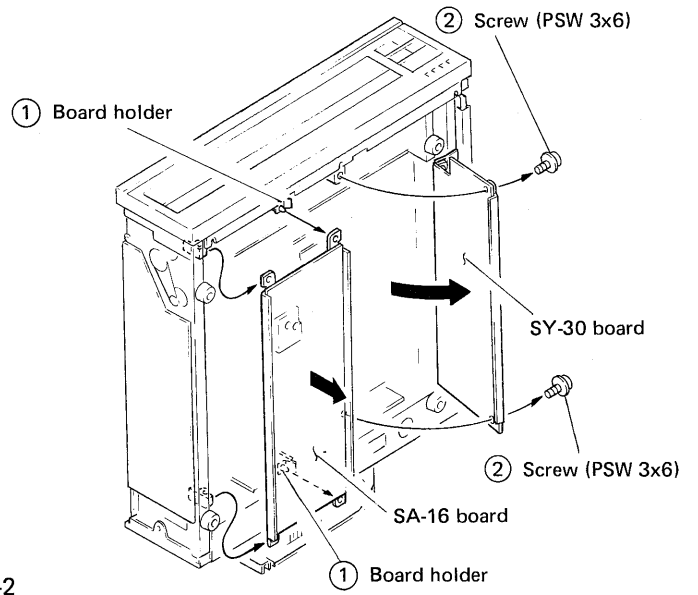
- **Removal of DM-45 Board, SV-69 Board, and SV-65 Board**

(1) Remove the one (PSW 3x6) screw and take off the MC-25 board.
(2) Remove the two board holders and open the board in the direction shown by the arrow.
(3) Remove the two board holders and turn the boards in the direction shown by the arrow.



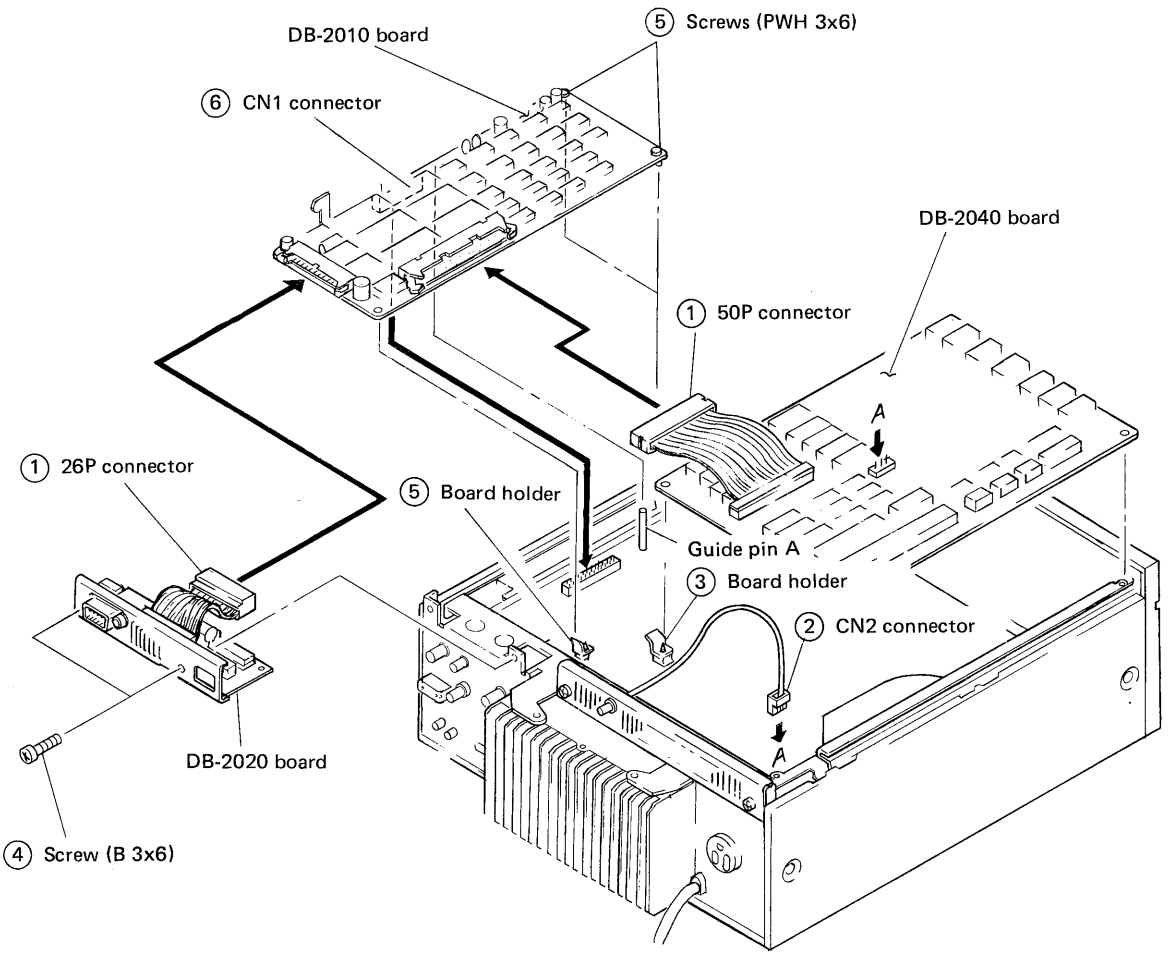
- **Removal of SA-16 Board, and SY-30 Board**

(1) Remove the two board holders and turn the SA-16 board in the direction shown by the arrow.
(2) Remove the two (PSW 3x6) screws and open the SY-30 board in the direction shown by the arrow.



- **Removal of Option Board**
  (DB-2010 Board, DB-2020 Board, and DB-2040 Board)

(1) Disconnect the connector, 50P and the connector, 26P.
(2) Disconnect the CN2 connector.
(3) Take the DB-2040 board off the board holders (from four places).
(4) Remove the two (B 3x6) screws and then take off the DB-2020 board.
(5) Loosen the two screws on DB-2010 board and take off the board holder.
(6) Disconnect the CN1 connector and take the DB-2010 board off the guide pin.



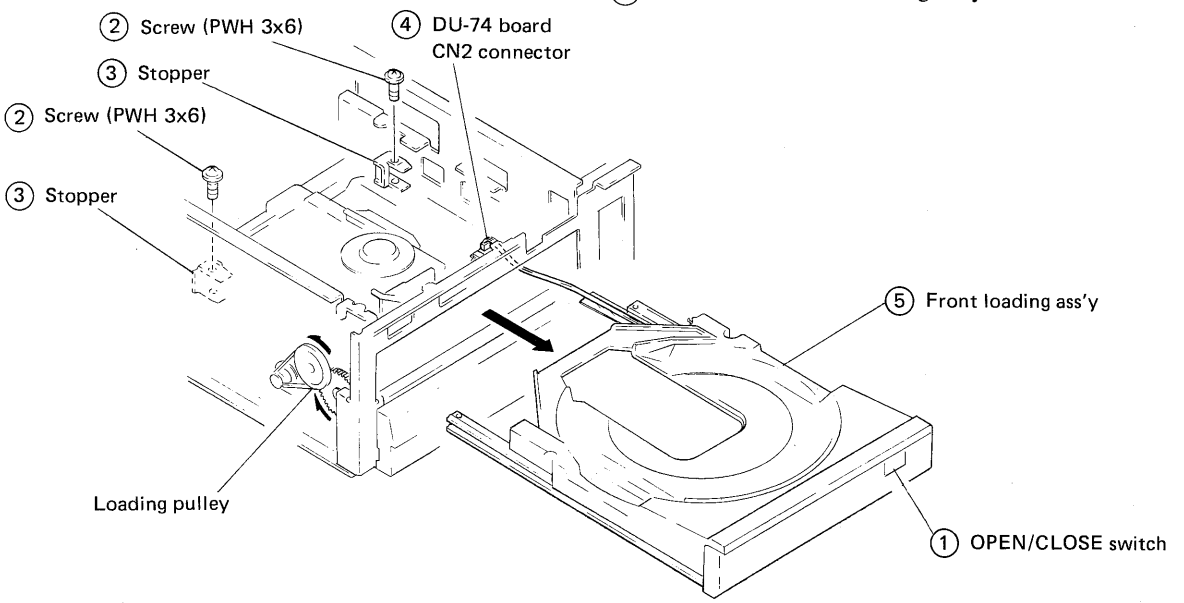
2-4. REMOVAL OF FRONT LOADING ASS'Y

① Push on the POWER switch, press the OPEN/CLOSE switch, and then pull out the front loading ass'y.
② Remove the two (PWH 3x6) screws.
③ Take off the right and left stoppers.
④ Disconnect the CN2 connector from the DU-74 board.
⑤ Remove the front loading ass'y.

Removal when the power supply is not connected to by trouble or the OPEN/CLOSE switch does not work.

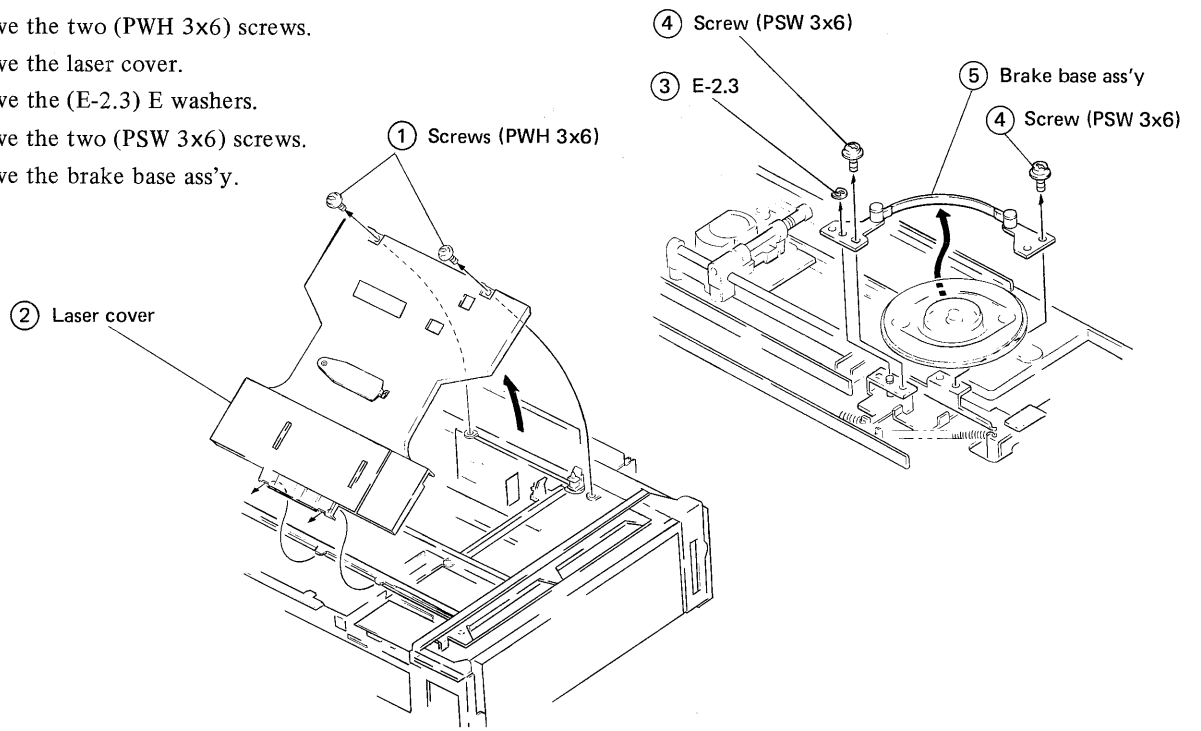
- Turn the loading pulley counterclockwise (indicated by the arrow) and pull out the front loading ass'y.

② Remove the two (PWH 3x6) screws.
③ Remove the right and left stoppers.
④ Disconnect the CN2 connector from the DU-74 board.
⑤ Remove the front loading ass'y.



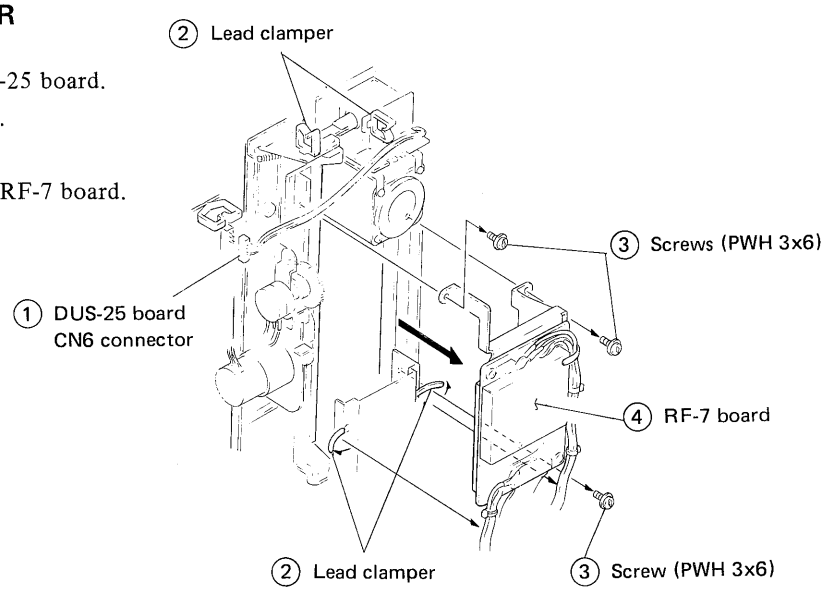
2-5. REMOVAL OF BRAKE BASE ASS'Y

① Remove the two (PWH 3x6) screws.
② Remove the laser cover.
③ Remove the (E-2.3) E washers.
④ Remove the two (PSW 3x6) screws.
⑤ Remove the brake base ass'y.

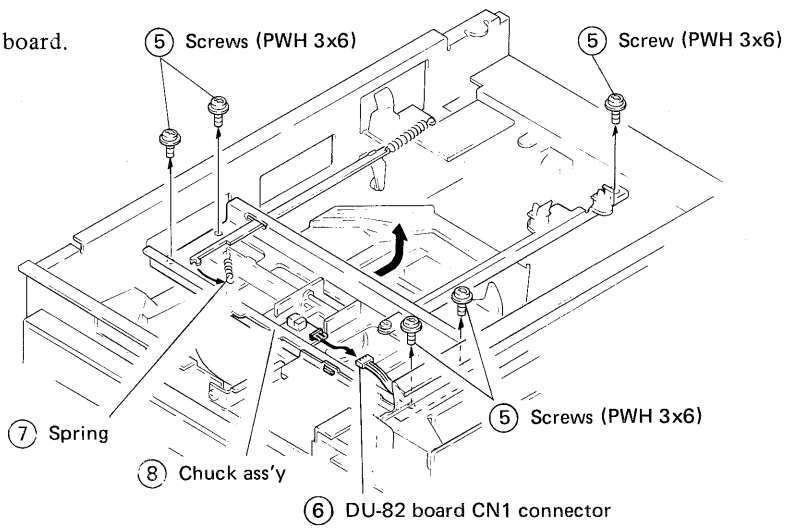


2-6. REMOVAL OF SPINDLE MOTOR

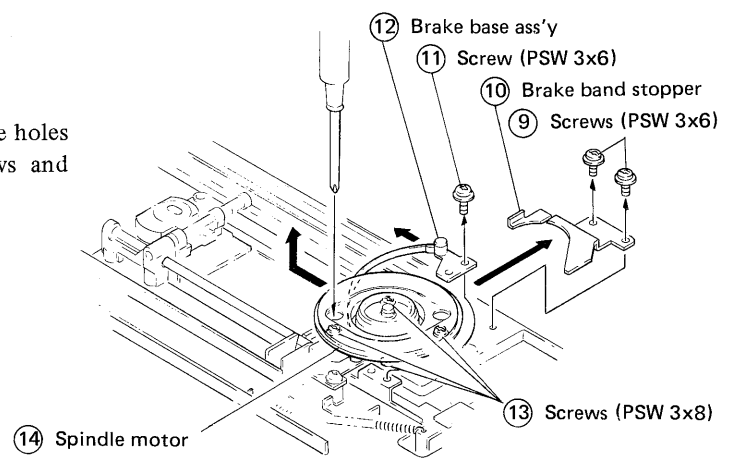
(1) Disconnect the CN6 connector on the DUS-25 board.
(2) Disconnect the leads from the lead clamper.
(3) Remove the three (PWH 3x6) screws.
(4) Remove the whole mounting metals of the RF-7 board.



(5) Remove the five (PWH 3x6) screws.
(6) Disconnect the CN1 connector from the DU-82 board.
(7) Unhook one end of the spring.
(8) Remove the chuck ass'y.

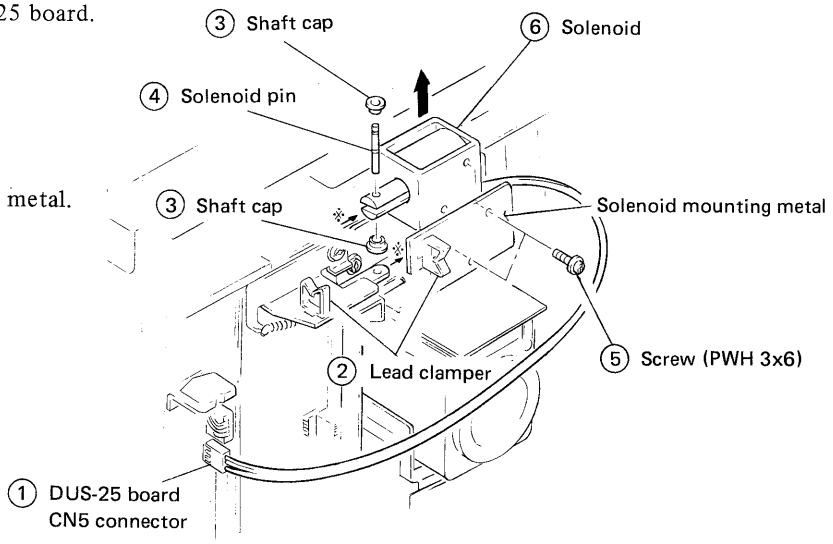


(9) Remove the two (PSW 3x6) screws.
(10) Remove the brake band stopper.
(11) Remove the (PSW 3x6) screw.
(12) Remove one side of the brake base ass'y.
(13) Turn the chuck of the spindle motor so that the holes on the chuck meet with the mounting screws and remove the four (PSW 3x8) screws.
(14) Remove the spindle motor.



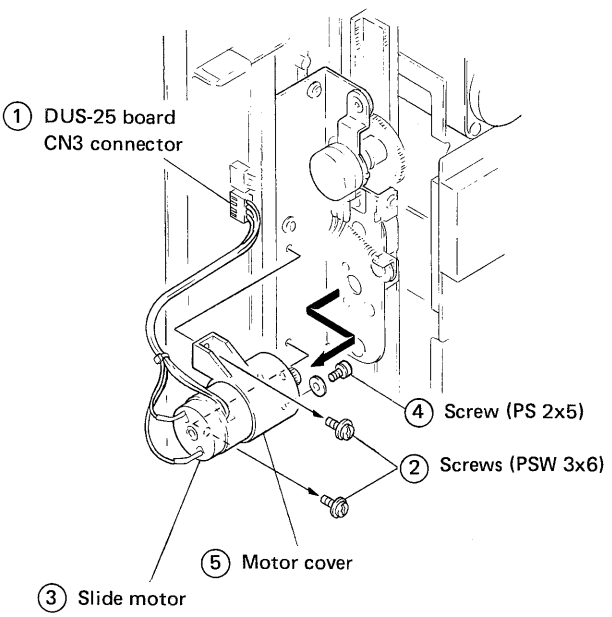
2-7. REMOVAL OF SOLENOID

(1) Disconnect the CN5 connector on the DUS-25 board.
(2) Disconnect the lead from the lead clamper.
(3) Remove the shaft cap.
(4) Take off the solenoid pin.
(5) Remove the two (PWH 3x6) screws.
(6) Take the solenoid off the solenoid mounting metal.



2-8. REMOVAL OF SLIDE MOTOR

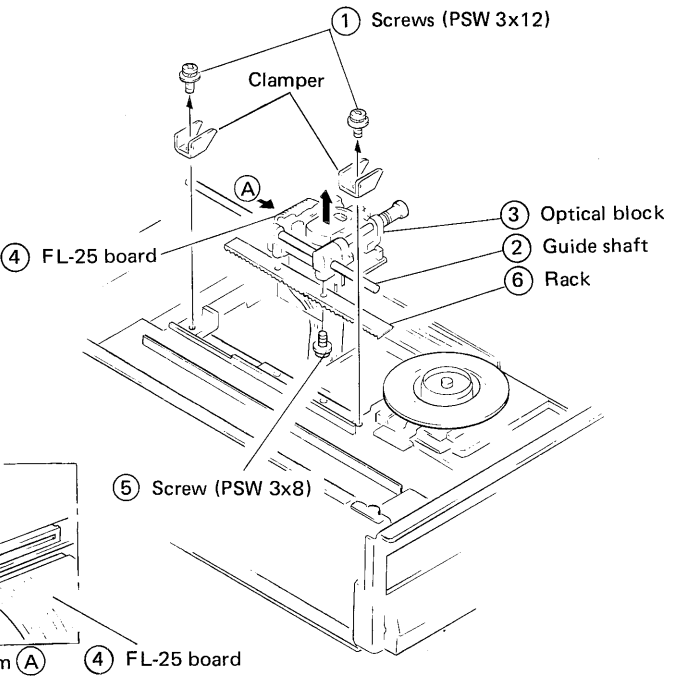
(1) Disconnect the CN3 connector on the DUS-25 board.
(2) Remove the two (PSW 3x6) screws.
(3) Remove the slide motor.
(4) Remove the three (PS 2x5) screws.
(5) Take off the motor cover.



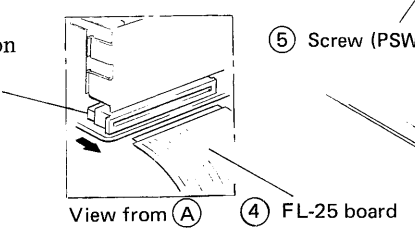
2-9. OPTICAL BLOCK

2-9-1. Removal of Optical Block Ass'y

① Remove the two (PSW 3x12) screws and then remove the clamper.
② Remove the guide shaft.
③ Pull the optical block ass'y.
④ Take off the FL-25 board.
⑤ Remove the two (PSW 3x8) screws.
⑥ Remove the rack.



- Pull the connector in the direction shown by the arrow and take off the FL-25 board.



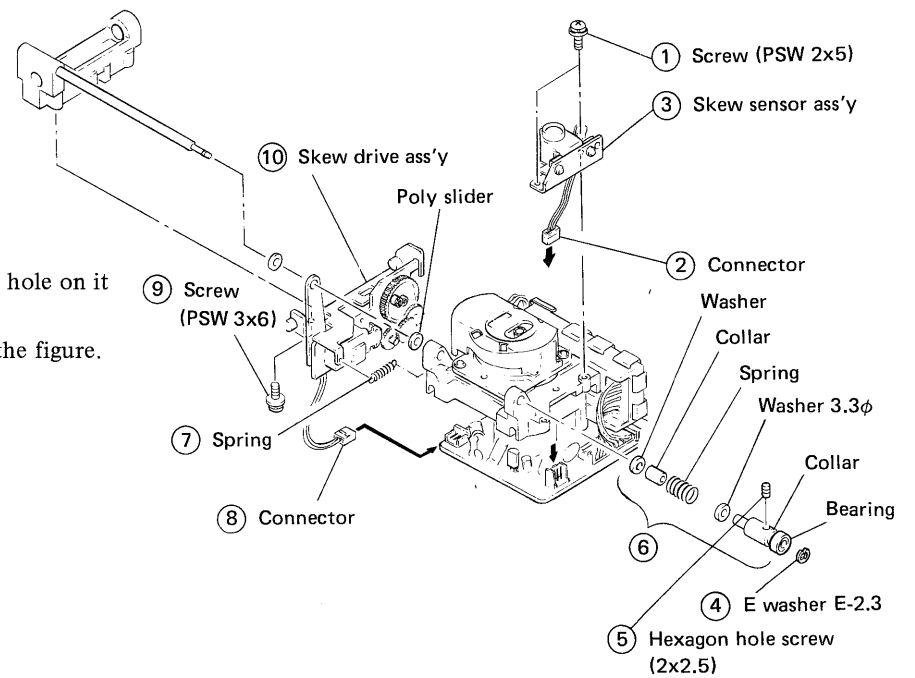
2-9-2. Disassembly of Optical Block Ass'y

- **Removal of Skew Sensor Ass'y**

① Remove the two (PSW 2x5) screws.
② Disconnect the connector.
③ Remove the skew sensor ass'y.

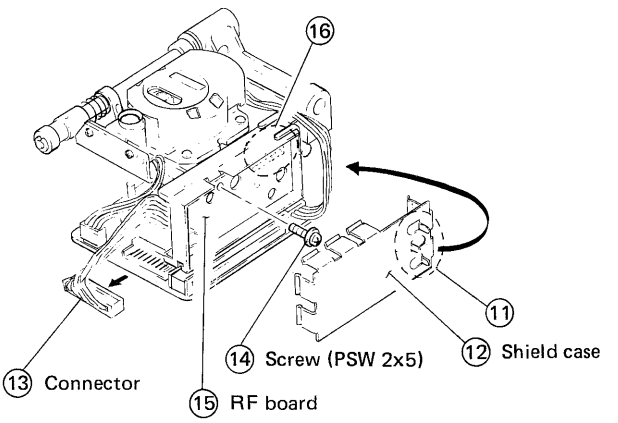
- **Removal of Skew Drive Ass'y**

④ Take off the (E-2.3) E washers.
⑤ Loosen the (2x2.5) screw with hexagon hole on it and remove the bearing and collar.
⑥ Remove the parts in order as shown in the figure.
⑦ Unhook the spring.
⑧ Disconnect the connector.
⑨ Remove the two (⊕ PSW 3x6) screws.
⑩ Remove the skew drive ass'y.



- **Removal of RF Board**

⑪ Disconnect the lead from the shield case.
⑫ Take off the shield case lid.
⑬ Remove the connector.
⑭ Remove the (PSW 2x5) screw.
⑮ Pull out the RF board.
⑯ Remove the band leads (by unsoldering the seven points).

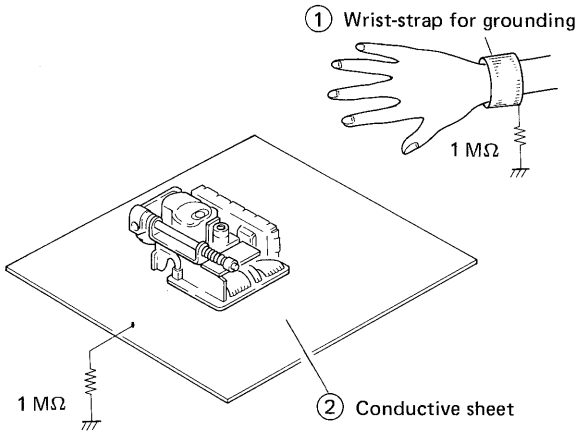


2-10. HANDLING OF OPTICAL BLOCK ASS'Y

Note for Handling of Optical Block Ass'y (KSS-140A)

- Sometimes electrostatic breakdown of the laser diode in the optical block ass'y is caused by potential difference between the electrostatic charge of the block and the one of clothes or a human body.
  Be careful to the following notes for preventing the diode from the breakdown.

1. Grounding for the human body
   Be sure to put on a wrist-strap for grounding (with impedance lower than $10^8\,\Omega$) whose other end is grounded. The strap works to drain away the static electricity build-up on the human body.
2. Grounding for the work table
   Be sure to lay on the table a conductive sheet (with impedance lower than $10^9\,\Omega$) such as a sheet of copper, which is grounded.
3. As static electricity build-up on clothes is not drained away, be careful not to let your clothes touch the unit.



Also, these notes are enclosed in repair part package.

The following manners are recommended as reference.
1. Cover a work table with a conductive sheet (black sheet used for the part package).
2. Place a set on the sheet so that the chassis of the set contacts the sheet (for making the potential of the set equal to the one of the sheet).
3. Put hands on the conductive sheet (for making the potential of a human body equal to the one of the sheet).
4. Take out the optical block ass'y from its bag.
5. Work should be done on the conductive sheet with care that clothes do not touch the optical block ass'y.

- Be careful not to put dust or fingerprints on the object lens and skew lens while handling.

SECTION 3
MECHANICAL ALIGNMENT

3-1. PREPARATION FOR ALIGNMENT

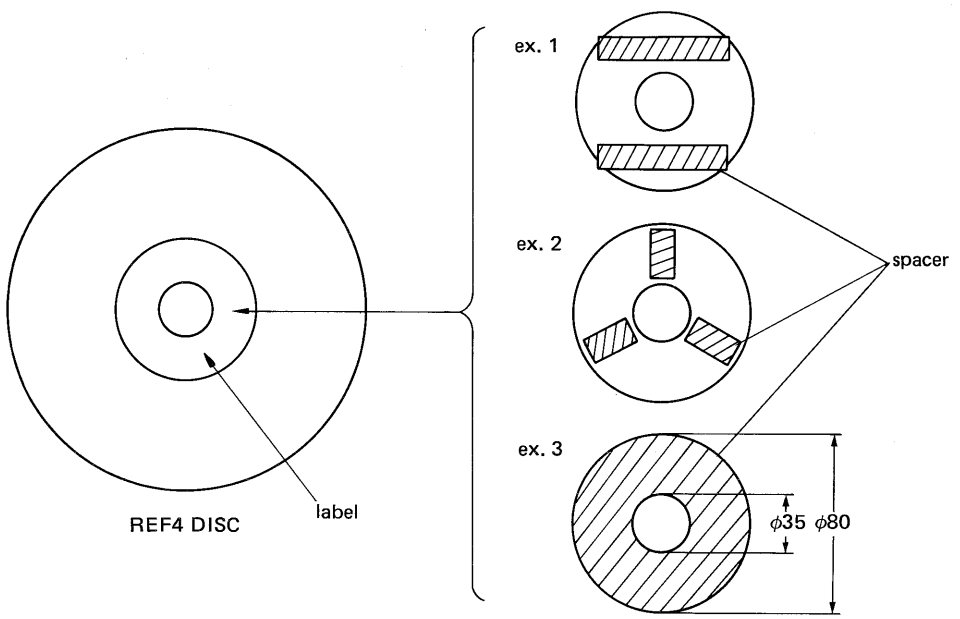
3-1-1. Instruments and Tools Used:

- Reference disc (3.5 mm thickness)
- Oscilloscope
- Slide vernier calipers

3-1-2. Reference Disc (3.5 mm thickness)

When performing the DU-82 board fixing adjustment or shutter ass'y position adjustment, reference disc (3.5 mm thickness) is required.
Affix (or pile on) the spacer on the REF4 disc (2.3~ 2.9 mm thickness) used as shown in Fig. 1. Measure the thickness with slide vernier calipers and adjust so that thickness is 3.5 mm. The adjustment should be performed with that disc (3.5 mm thickness).

Example for affixing the spacer



Affix the spacer on the REF4 DISC
so that the thickness is 3.5 mm.

Fig. 1

3-2. DU-82 BOARD FIXING ADJUSTMENT

1) Connect the oscilloscope to the 5 pin of the CN9 connector on the SY-30 board.
2) Insert the reference disc (3.5 mm thickness).
3) Turn on the power and press the OPEN/CLOSE button and then perform loading.
4) After loading, adjust the DU-82 board in the direction shown by the arrow in Fig. 2-1 so that the voltage meets +5 VDC, and tighten the fixing screw.
5) When performing loading with no disc, confirm that the voltage is 0 V.
6) Perform loading with the reference disc (3.5 mm thickness) again, and confirm that there is no worse.

3-3. CHUCK ASS'Y PRESSING ADJUSTMENT

1) Insert the REF4 disc.
2) Turn on the power and press the OPEN/CLOSE button and then perform the loading.
3) After the chucking, turn off the power.
4) Adjust the adjust hole as shown in Fig. 2-2 so that the hole of the C arm ass'y and the space **A** of the link (3) meets 0.6~1 mm.
   Tighten the fixing screw.

3-4. SAFETY SWITCH POSITION ADJUSTMENT

1) Connect the oscilloscope to the 2 pin of CN5 connector on the RF-7 board.
2) Insert the F.L ass'y by hand (with no disc).
3) Adjust the safety switch in the direction shown by the arrow **A**, **B** in Fig. 2-3 so that the voltage at the beginning of descending of the tray meets −12 VDC. Adjust by the same way so that the voltage meets 0 V at the position of 10 mm forth from the descending point.
   Tighten the fixing screw.

3-5. SHUTTER ASS'Y POSITION ADJUSTMENT

1) Connect the oscilloscope to the 4 pin of the CN9 connector on the SY-30 board.
2) Insert the reference disc (3.5 mm thickness).
3) Turn on the power and press the OPEN/CLOSE button and perform loading.
4) After loading, adjust the shutter ass'y in the direction shown by the arrow in Fig. 2-4 so that the voltage meets +5 VDC, and tighten the fixing screw.
5) When performing the loading with no disc, confirm that the voltage is +5 VDC. (Confirm that the unloading end is +5 VDC, too).

NOTE: In case of removing the shutter ass'y in the direction shown by the arrow **A**. Adjust the shutter ass'y so that **a** part and ※ part of the shutter ass'y does not contact. And adjust the shutter ass'y in the direction shown by the arrow **B** so that the slit between the shutter ass'y and the guide rail ass'y meets 0.5 mm.

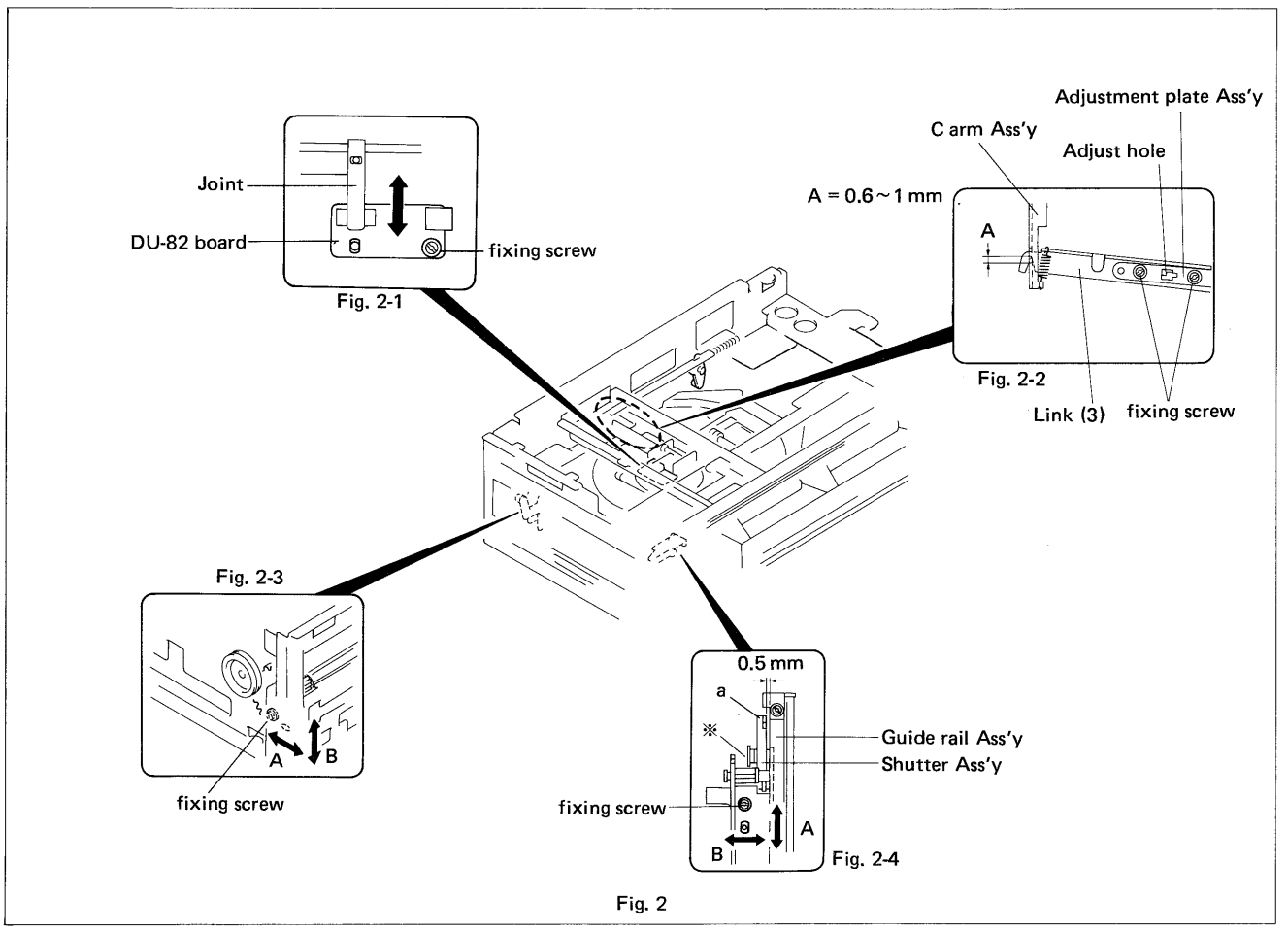

Joint
DU-82 board
fixing screw
Fig. 2-1
Adjustment plate Ass'y
C arm Ass'y
Adjust hole
A = 0.6~1 mm
A
Fig. 2-2
Link (3)
fixing screw
Fig. 2-3
A
B
fixing screw
0.5 mm
a
※
Guide rail Ass'y
Shutter Ass'y
fixing screw
A
B
Fig. 2-4

Fig. 2

3-6. BRAKE BAND ASS'Y FIXING ADJUSTMENT

- Perform this adjustment when replacing the brake band ass'y or the spindle motor.
  Adjust the position of the brake arm so that meets at the center of the square hole of the brake arm as shown in Fig. 3 and tighten the fixing screw.

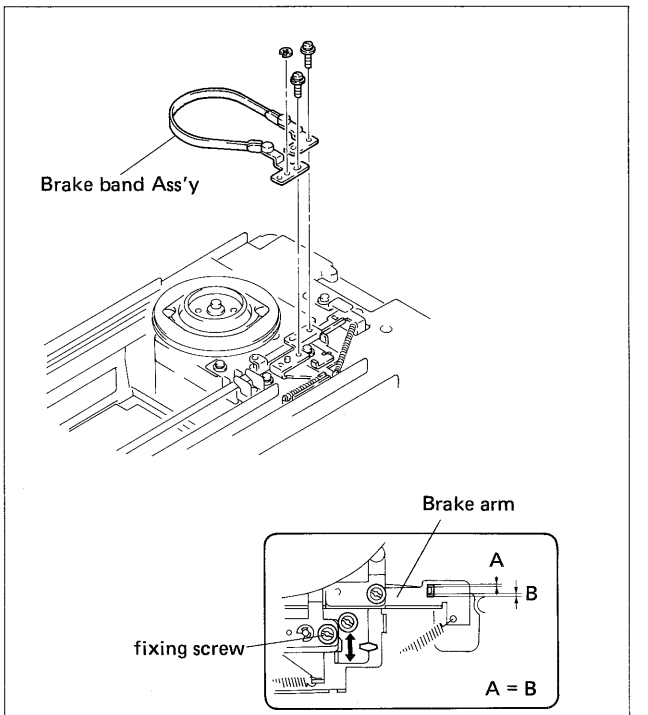


Fig. 3

3-7. PLUNGER SOLENOID FIXING ADJUSTMENT

- Perform this adjustment when replacing the plunger solenoid.
  Pull the plunger solenoid by hand (draw the plunger solenoid in the direction shown by the arrow). Adjust the position of a of the arm so that meets at the center of the square window and tighten the fixing screw.

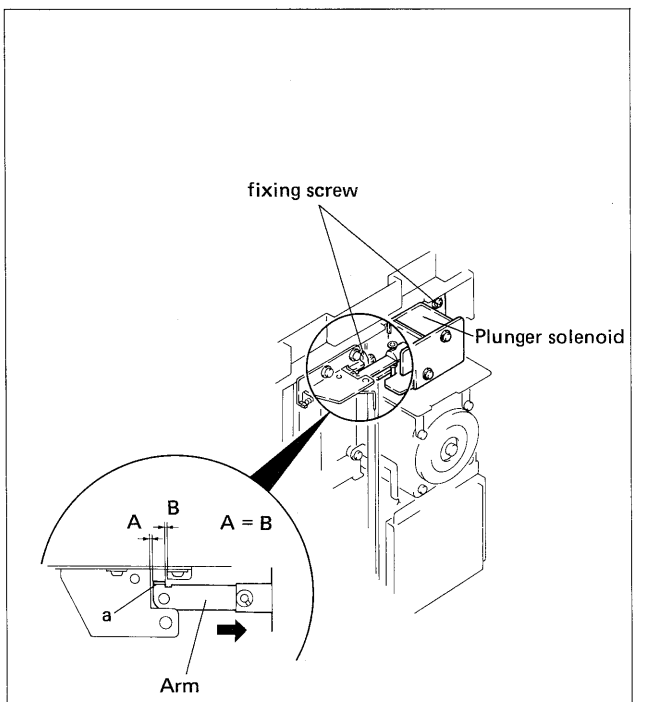


Fig. 4

3-8. POTENTIOGEAR POSITION ADJUSTMENT

- Perform this adjustment when replacing the optical block ass'y, the motor block ass'y and the rack.
  Fit the dented part of the rack and the dented part of the potentiogear as shown in Fig. 5 and attach the motor block ass'y with tightening the fixing screw.

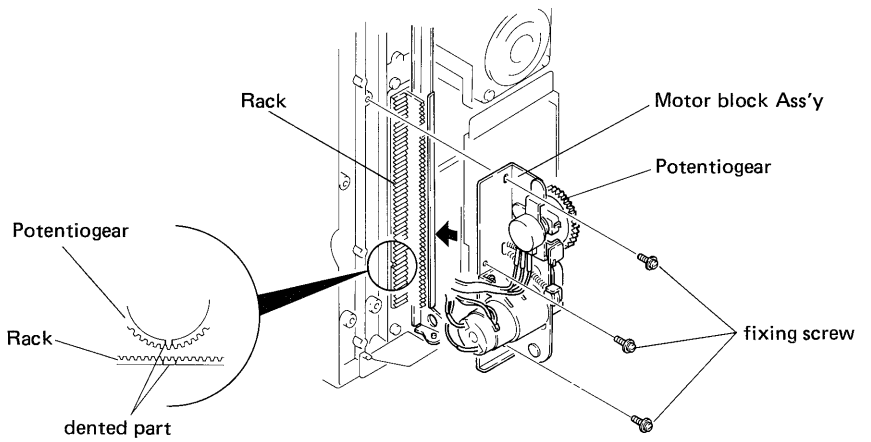


Fig. 5

3-9. GUIDE SHAFT FIXING ADJUSTMENT

- Perform this adjustment when replacing the optical block ass'y.
  Adjust the position of the guide shaft so that the edge of the guide shaft meets A of the base as shown in Fig. 6.

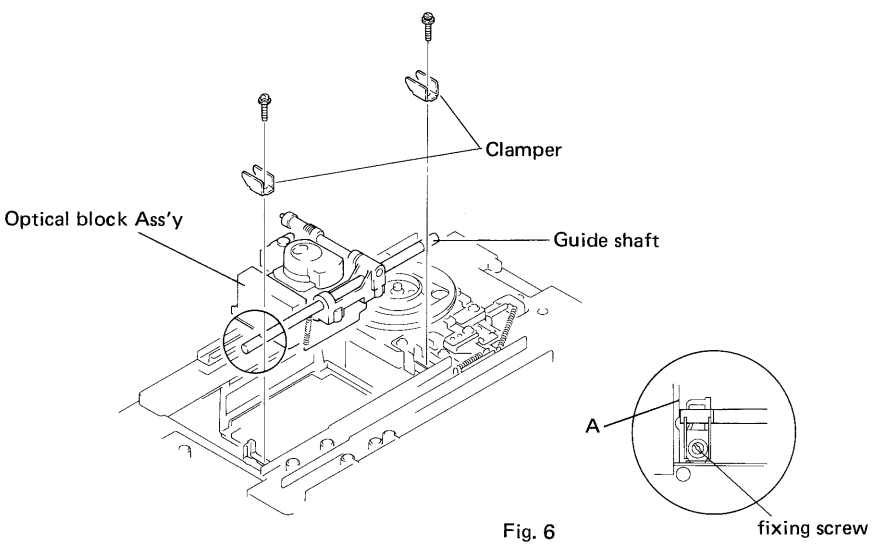


Fig. 6

SECTION 4
ELECTRICAL ALIGNMENT

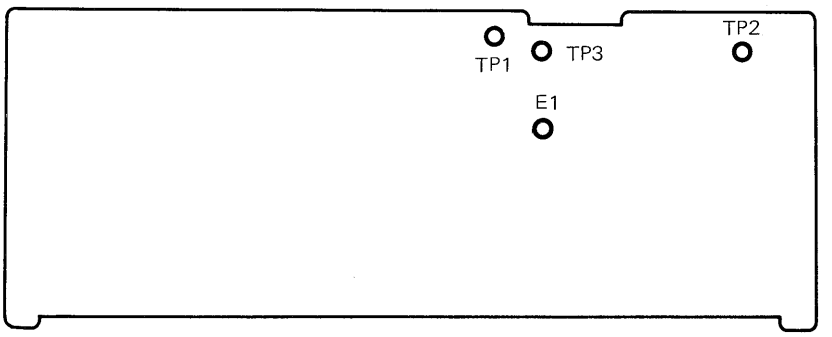
4-1. CONFIRMATION OF DC POWER SUPPLY

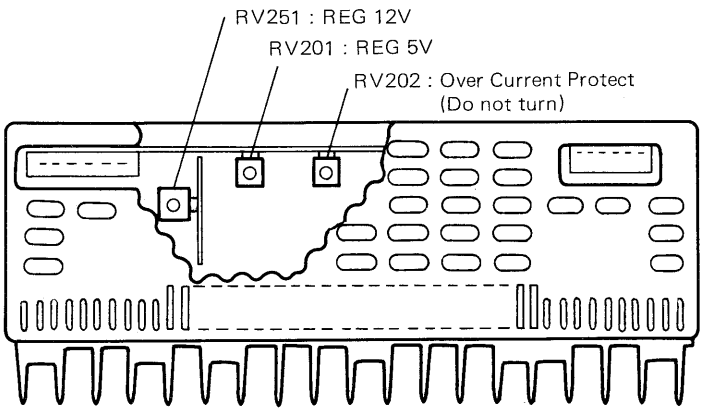
Conditions for adjustment	Specifications	Adjustments
• POWER ON status.	(1) REG 12V CHECK TP1/AC-49 +11.85 to +12.35 Vdc TP3/AC-49 −11.1 to −13.1 Vdc	⊘ RV251/UR-12
	(2) REG 5V CHECK TP2/AC-49 +5.0 to +5.4 Vdc	⊘ RV201/UR-12

If the REG 12V and REG 5V adjustments are attempted, re-alignments of the servo system, video system and audio system are required. Do not attempt adjustment to the dc power supply unless machine performance is obviously poor due to incorrect power supply voltage. If adjustments are made to the power supply, re-alignments of the servo system, video system and audio system are necessary.

[Adjustment Locations]

AC-49 board (component side)

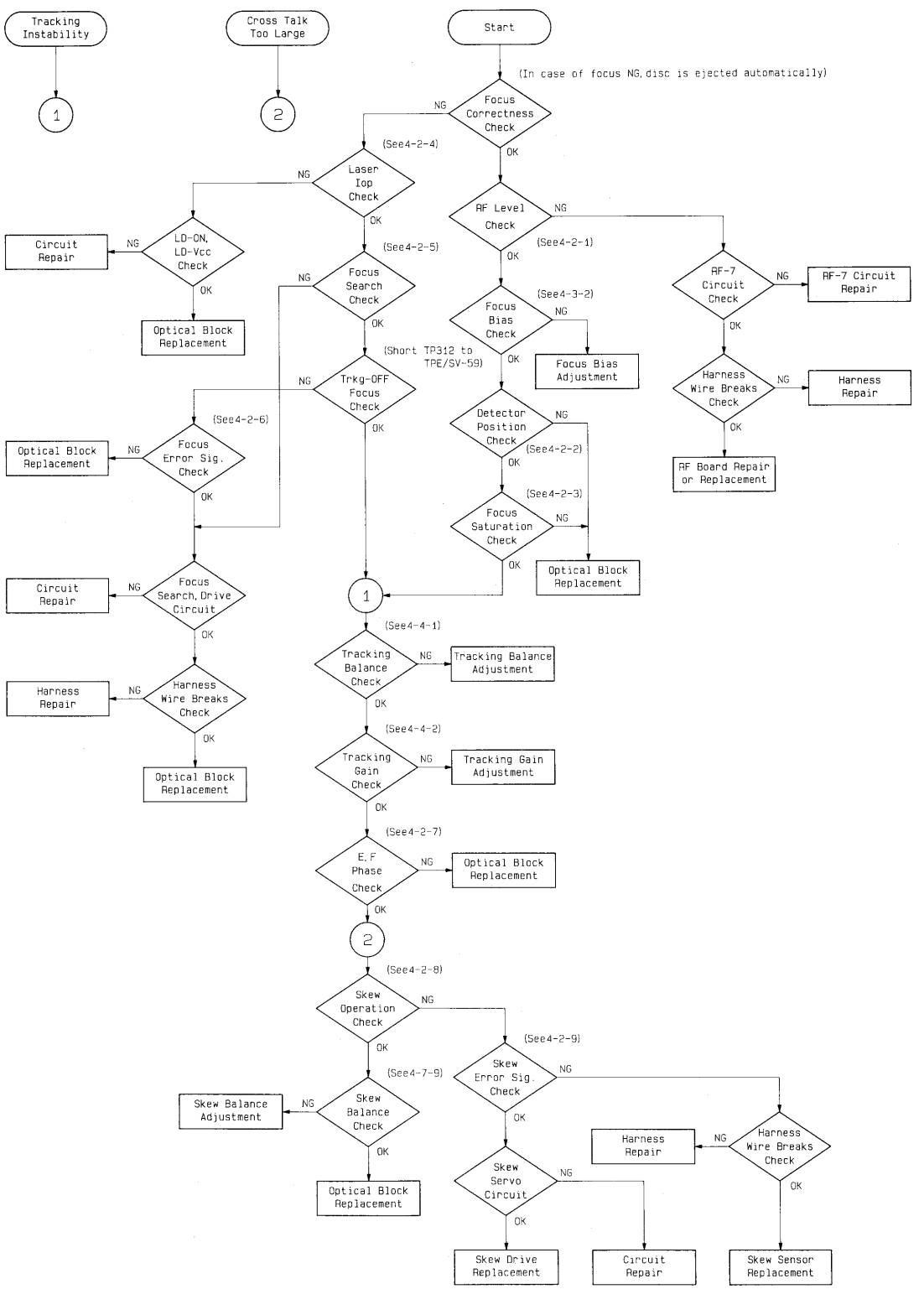




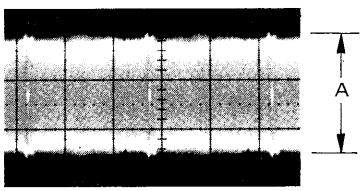
UR-12 (bottom view)

4-2. CONFIRMATION OF OPTICAL BLOCK

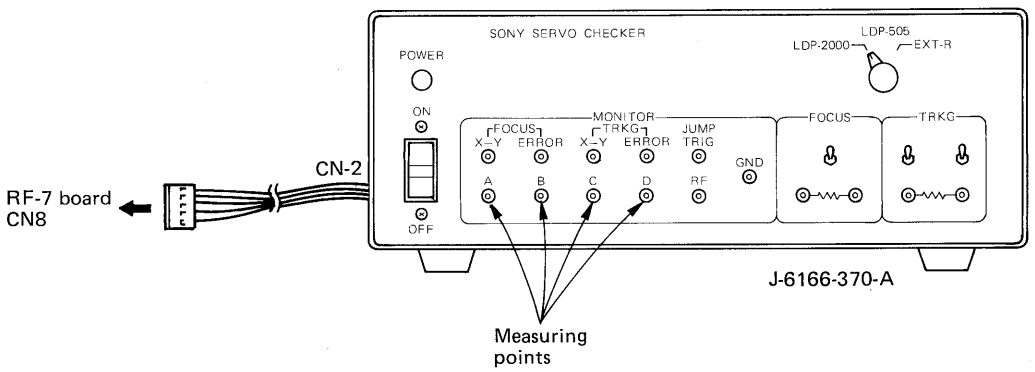
[Check Procedure]



4-2-1. RF Level Check

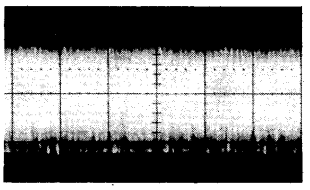
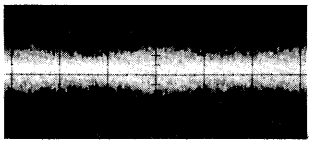
Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • Search for frame 100. • STILL mode.	TP1/DM-45 TRIG; TP17/DM-45  A = more than 200 mV	

4-2-2. Detector Position Check



Conditions for adjustment	Specifications	Adjustments
• Connect the SERVO CHECKER as above-mentioned. • REF4 disc. • PLAY mode.	Measure the dc levels A –D on the terminals of SERVO CHECKER. $\frac{(A + C) - (B + D)}{A + B + C + D} \times 100\ (\%) = X$ $\frac{(A + D) - (B + C)}{A + B + C + D} \times 100\ (\%) = Y$ $\lvert X \rvert + \lvert Y \rvert \leqq 50\ \%$	

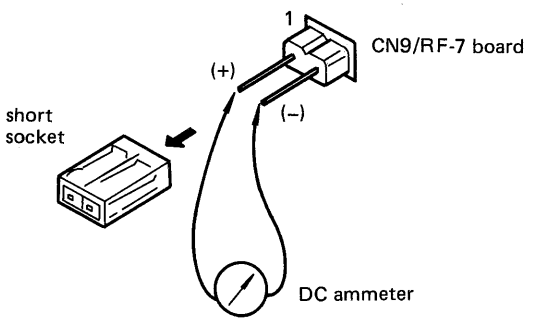
4-2-3. Focus Saturation Check

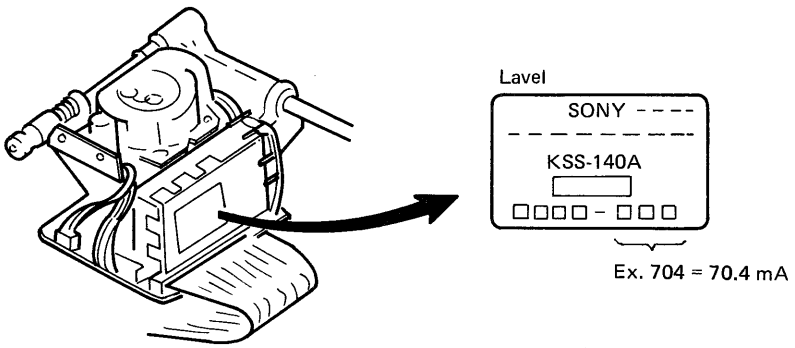
Conditions for adjustment	Specifications	Adjustments
• REF4 disc • Search for frame 100 to 5,000.	TP305/SV-59 TRIG; TP17/DM-45 NG  The saturated points appear wholly. OK  Confirm that focus drive signal is not saturated completely at search mode.	

4-2-4. Laser I-op Check

Disconnect a short socket on CN9/RF-7 board, and connect a dc ammeter as follows.

Note: Before a short socket disconnects from CN9, turn off the power switch of the LDP-2000.
Be sure to put on a wrist-strap for grounding (with impedance lower than $10^8\Omega$) whose other end is grounded. The strap works to drain away the static electricity build-up on the human body.

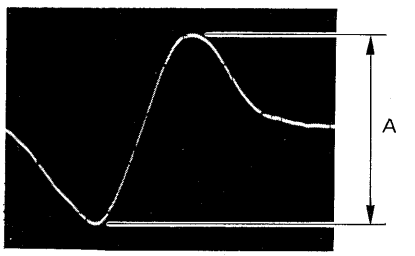


Conditions for adjustment	Specifications	Adjustments
• Laser on status	[Reading of an ammeter] = [Valu mentioned lavel] ± 10 mA  Lavel SONY - - - - KSS-140A □□□□-□□□ Ex. 704 = 70.4 mA	

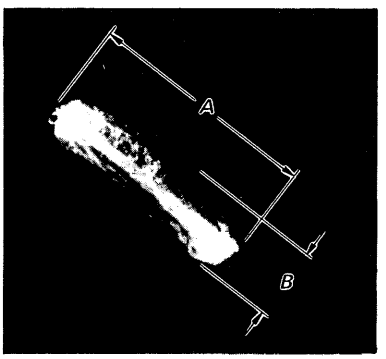
4-2-5. Focus Search Operation Check

Conditions for adjustment	Specifications	Adjustments
• Operate the spindle motor without disc. (Grasp the turn table with hand and turn on the power. Take your hand off the turn table 2 or 3 seconds later.)	Confirm that the objective lens is risen smoothly. The disc compartment is ejected automatically after repeating a focus search operation 5 times.	

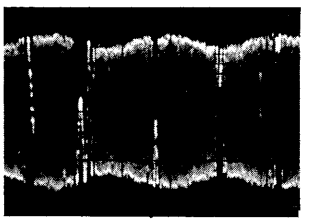
4-2-6. Focus Error Signal Check

Conditions for adjustment	Specifications	Adjustments
• Any disc. • Make a moment that the focus servo system is started. (Install a disc or turn on the power at the installing a disc.)	TP301/SV-59 TRIG; TP17/DM-45  S-shaped error signal should be appeared at the focus search mode. A = more than 6 V	

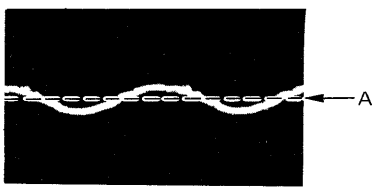
4-2-7. E, F Phase Check

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • Search for frame 1,000. • Short TP108 to TPE4 on the SV-59 board. (slide off) • Short TP312 to TPE6 on the SV-59 board. (tracking off)	X–Y mode X: TP309/SV-59 Y: TP310/SV-59  A ≧ 2.5 B	

4-2-8. Skew Operation Check

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • Search for frame 25,000. • Short TP108 to TPE4 on the SV-59 board. (slide off) • Short TP312 to TPE6 on the SV-59 board. (tracking off)	TP311/SV-59 TRIG; TP17/DM-45  When turning the RV201/SA-16, amplitude should be changed. After completing this check, perform the Sec. 4-7-9. Skew Balance Adjustment.	

4-2-9. Skew Sensor Check

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • PLAY mode	TP205/SA-16  A = –2.5 to –6.5 Vdc Error signal (30Hz) should be appeared.	

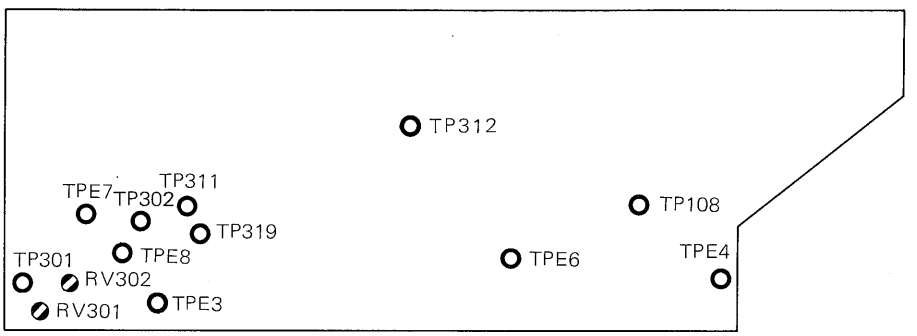
4-3. FOCUS SERVO SYSTEM ADJUSTMENT

[Equipment Required]

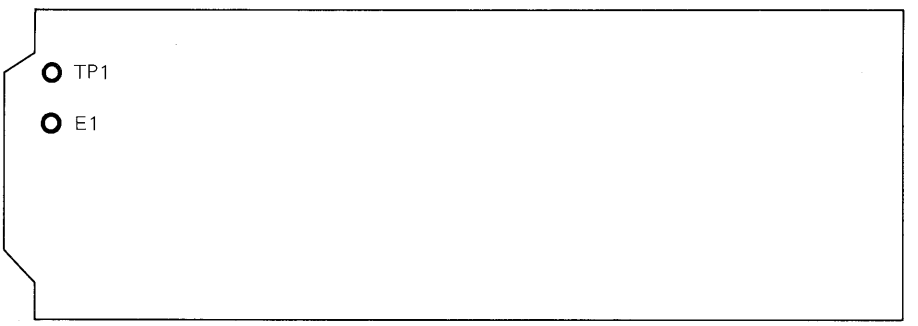
- Reference disc, REF-4-12AM-S (8-847-016-00)
- Focus/tracking fixture (J-6166-370-A)
- Remote control unit, RM-2001 or RM-1002
- Oscilloscope
- Picture monitor

[Adjustment Locations]

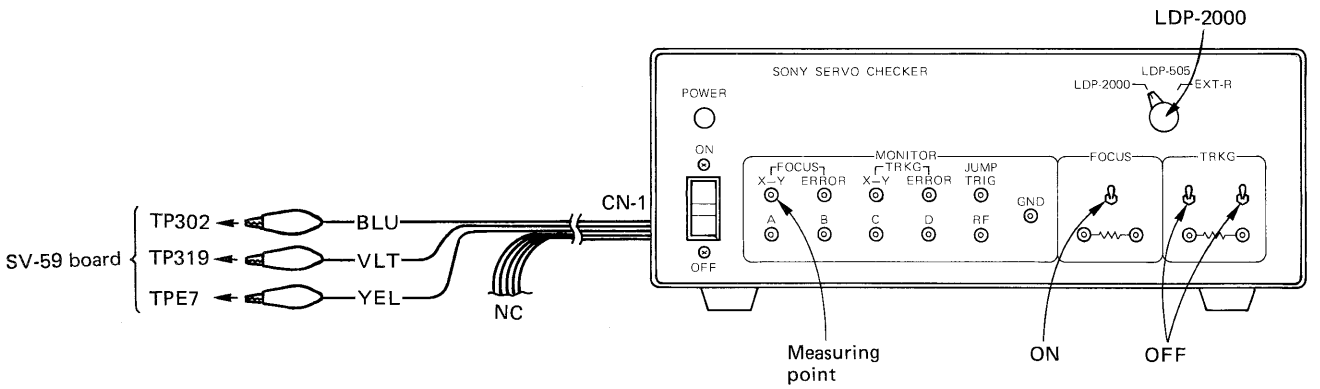
SV-59 board (soldering side)



DM-45 board (soldering side)

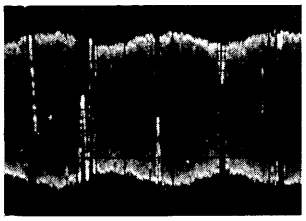
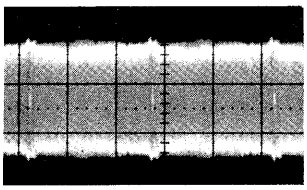


4-3-1. Gain Adjustment



Conditions for adjustment	Specifications	Adjustments
• Connect the SERVO CHECKER as above-mentioned. • REF4 disc. • Search for frame 15,000. • STILL mode.	FOCUS X–Y terminal 0.2 Vdc	RV301/SV-59

4-3-2. Bias Adjustment

Conditions for adjustment	Specifications	Adjustments
(1) • REF4 disc. • Search for frame 25,000. • STILL mode. •Short TP108 to TPE4 on the SV-59 board. (slide off) • Short TP312 to TPE6 on the SV-59 board. (tracking off)	TRIG; TP17/DM-45 TP311/SV-59  Maximize the amplitude	◐ RV302/SV-59 Measure the dc level on TP301/SV-59 after this adjustment. (=A)
(2) • Remove two shorting wires in step (1). • REF4 disc. • Search for frame 25,000. • STILL mode.	TRIG; TP17/DM-45 TP1/DM-45  Maximize the amplitude	◐ RV302/SV-59 Measure the dc level on TP301/SV-59 after this adjustment. (=B)
(3) In case of A ≠ B, set RV302 as follows. dc level on TP301 = $\frac{A + B}{2}$		

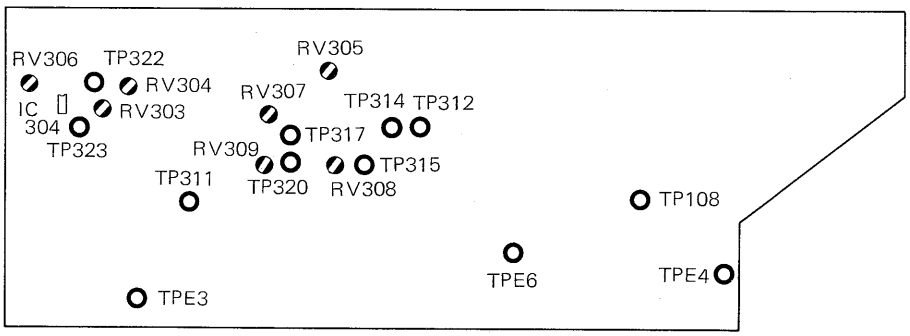
4-4. TRACKING SERVO SYSTEM ADJUSTMENT

[Equipment Required]

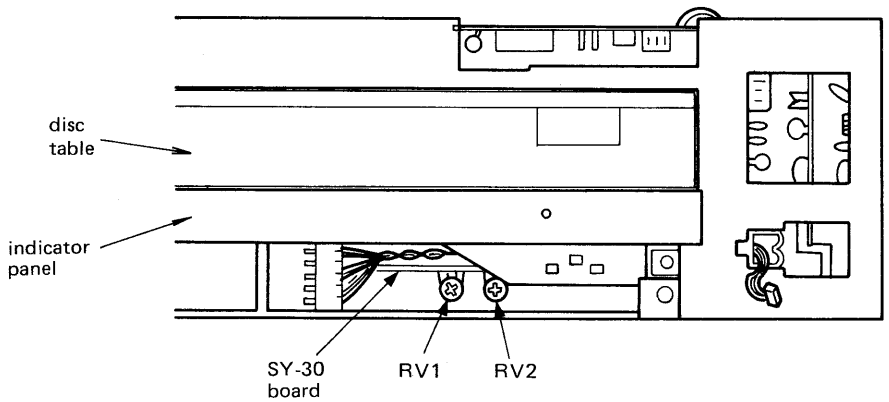
- Reference disc, REF-4-12AM-S (8-847-016-00)
- Focus/tracking fixture (J-6166-370-A)
- Remote control unit, RM-2001 or RM-1002
- Oscilloscope dual trace
- Picture monitor
- DC voltmeter

[Adjustment Locations]

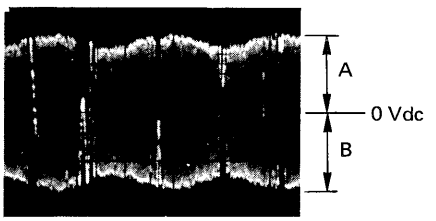
SV-59 board (soldering side)



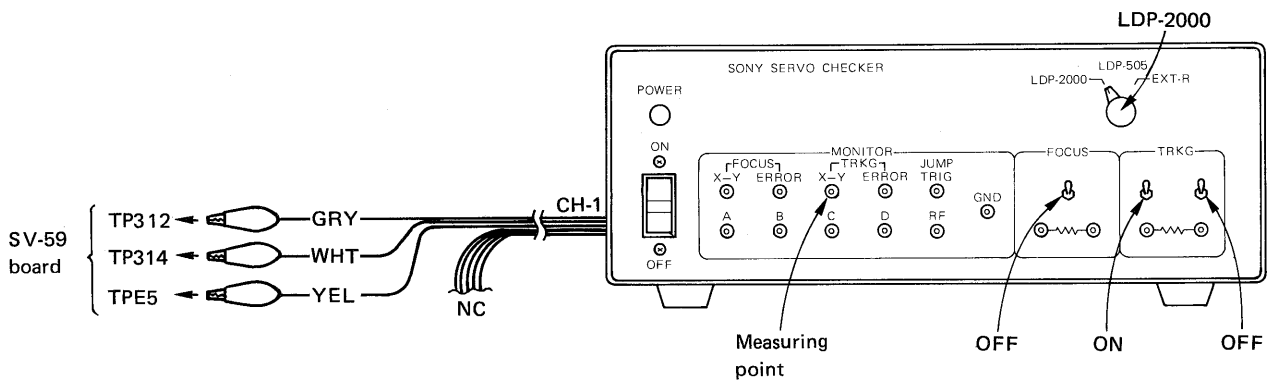
Front view



4-4-1. E.F Balance Adjustment

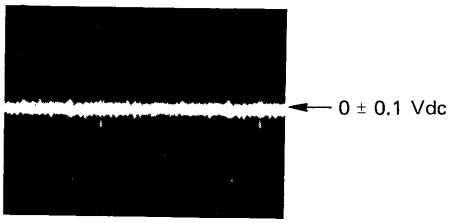
Conditions for adjustment	Specifications	Adjustments
• REF4 disc • Search for frame 25,000. • STILL mode. • Short TP108 to TPE4 on the SV-59 board. (slide off) • Short TP312 to TPE6 on the SV-59 board. (tracking off)	TP311/SV-59 TRIG; TP17/DM-45  A = B (A − B ≦ 0.1 V)	◐ RV306/SV-59

4-4-2. Gain Adjustment

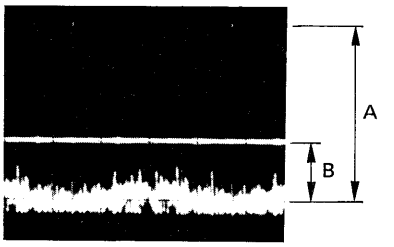


Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • Search for frame 50,000. • PLAY mode. • Connect the SERVO CHECKER as above-mentioned.	TRKG X–Y terminal 	◐ RV305/SV-59

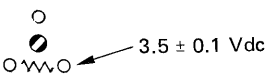
4-4-3. Bias Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • Search for frame 25,000. • STILL mode.	TP311/SV-59  	◐ RV304/SV-59

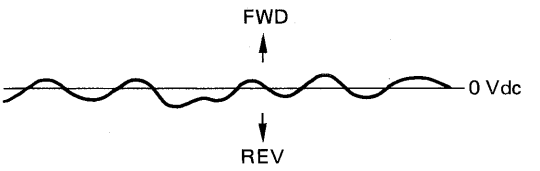
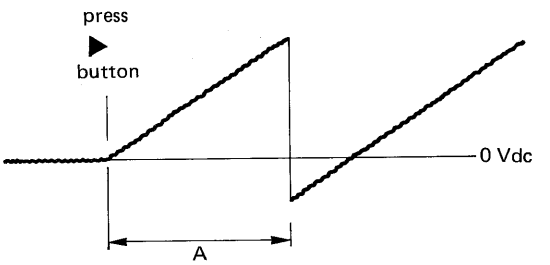
4-4-4. Brake Pulse Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • Search for frame 25,000. • STILL mode	ALT mode TRIG; TP17/DM-45 TP322/SV-59 (RV303-center) TP323/SV-59 (IC304-3 pin)  $B = \frac{A}{3} \pm 5\%$ Note: Adjust scope's vertical position so that CH-1 and CH-2 display have same 0Vdc position. Select the CH-1 and CH-2 VOLTS/DIV switches to same position.	◐ RV303/SV-59

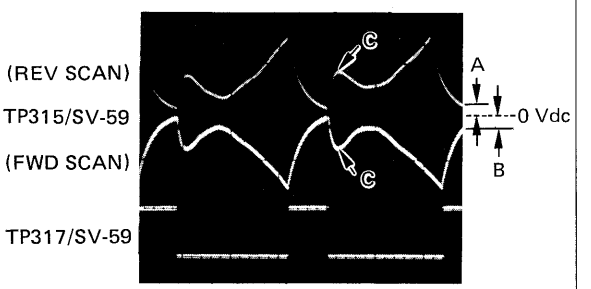
4-4-5. Brake On Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • FWD PLAY mode.	RV309/SV-59  	◐ RV309/SV-59

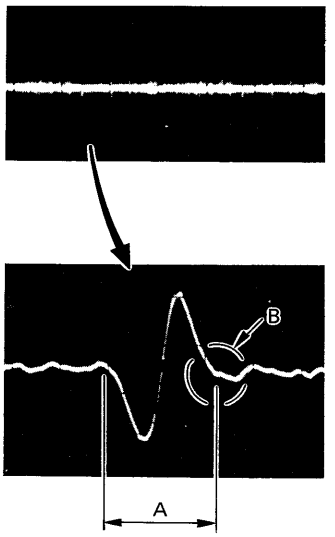
4-4-6. Limit Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • Search for frame 25,000. • Short TP108 to TPE4 on the SV-59 board. (slide off)	TP315/SV-59  Press the [STILL/STEP ❚❚▶] button or [STILL/STEP ◀❚❚] button until the dc level on TP315 is 0Vdc.	
Press the [FWD ▶] button in succession above condition.	TP315/SV-59  A = 6 ± 0.5 sec	◐ RV308/SV-59

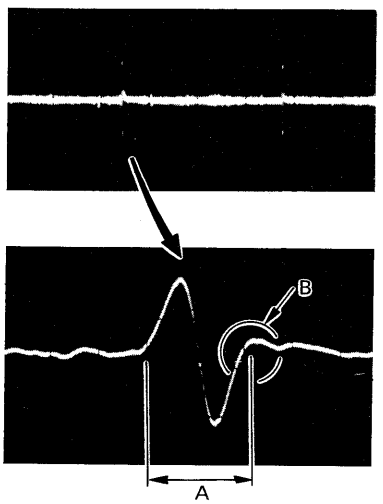
4-4-7. Scan Off Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • FWD SCAN mode and REV SCAN mode.	CHOP mode  Minimize the 'A' and 'B'. A = B ≧ 0 Confirm that the protuberances are found in the 'C' portion.	◐ RV307/SV-59

4-4-8. Still Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • Search for frame 30,000. • STILL mode	TP311/SV-59 TRIG; TP17/DM-45  A = 200 to 300 μs Confirm that the slope 'B' portion is smooth.	◐ RV2/SY-30

4-4-9. x3 Speed Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • FWD FAST x 3 mode.	TP311/SV-59 TRIG; TP17/DM-45  A = 200 to 300 μs Confirm that the slope 'B' portion is smooth.	◐ RV1/SY-30

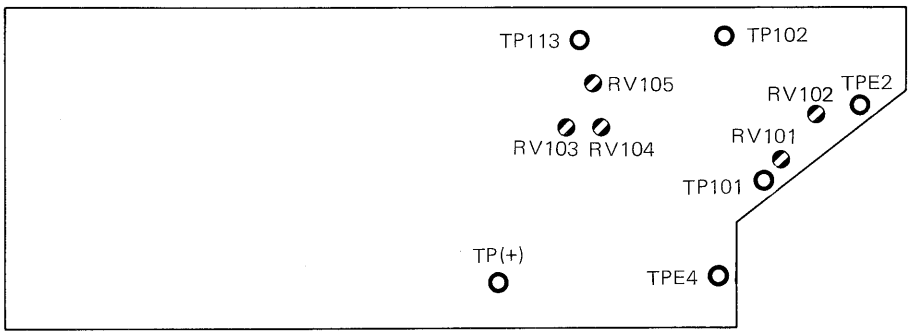
4-5. SLIDE SERVO SYSTEM ADJUSTMENT

[Equipment Required]

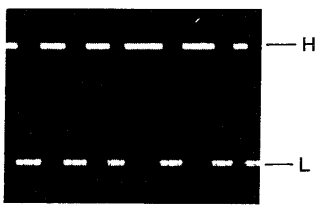
- Reference disc, REF-4-12AM-S (8-847-016-00)
- Reference disc, REF-5-12CAD (8-847-018-00)
- Exclusive ROM for service (J-6166-410-A)
- Remote control unit, RM-2001 or RM-1002
- Oscilloscope dual trace
- Picture monitor

[Adjustment Locations]

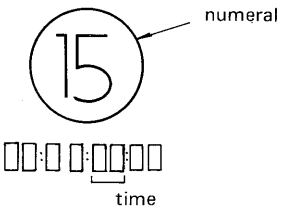
SV-59 board (soldering side)

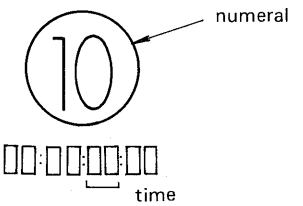


4-5-1. Offset Adjustment

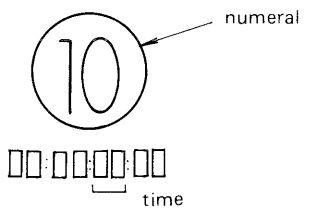
Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • Search for frame 20,000. • STILL mode.	TP102/SV-59  'H' level : 'L' level = 30 to 70 %	◐ RV102/SV-59

4-5-2. Inner/Outer Limit Adjustment

<table>
<tr><th>Conditions for adjustment</th><th>Specifications</th><th>Adjustments</th></tr>
<tr><td colspan="3">(1) Preparation
• Exchange the IC16/SY-30 for exclusive ROM.
• If the DB-2010 Control Expansion Board is installed, take off it.</td></tr>
<tr><td>(2) Inner Limit Adjustment
• REF5 disc.
• Search for frame 1.</td><td>Press the [MENU] button, following monitor picture will be displayed in the still mode.
 

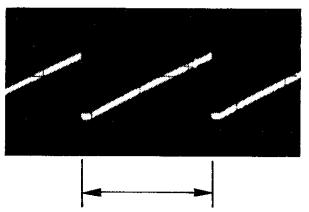
Numeral and time should be displayed with one of following values.
<table><tr><td>Numeral</td><td>15</td><td>15</td><td>16</td><td>16</td></tr><tr><td>Time</td><td>28</td><td>29</td><td>30</td><td>31</td></tr></table></td><td>● RV103/SV-59</td></tr>
<tr><td>(3) Outer Limit (12") Adjustment
• REF5 disc.
• Search for frame 54,000.</td><td>Press the [STOP] button, following monitor picture will be displayed in the still mode.
 

Numeral and time should be displayed with one of following values.
<table><tr><td>Numeral</td><td>10</td><td>10</td><td>11</td><td>11</td></tr><tr><td>Time</td><td>18</td><td>19</td><td>20</td><td>21</td></tr></table></td><td>● RV104/SV-59</td></tr>
</table>

(4) Outer Limit (8'') Adjustment • Connect temporarily 100kΩ resister between TP(+) and TP113 on the SV-59 board. (8'' mode) • REF5 disc. • Search for frame 24,600.	Press the [STOP] button, following monitor picture will be displayed in the still mode.  Numeral and time should be displayed with one of following values. Numeral: 10 / 10 / 11 / 11 Time: 18 / 19 / 20 / 21	◐ RV105/SV-59

After completing this adjustment, restore the IC16 in the step (1) and disconnect the 100 kΩ resister in the step (4).

4-5-3. Scan Speed Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF5 disc. • FWD SCAN or REV SCAN mode	TP101/SV-59 TRIG; INT  Adjust to be in both FWD SCAN and REV SCAN mode.	◐ RV101/SV-59

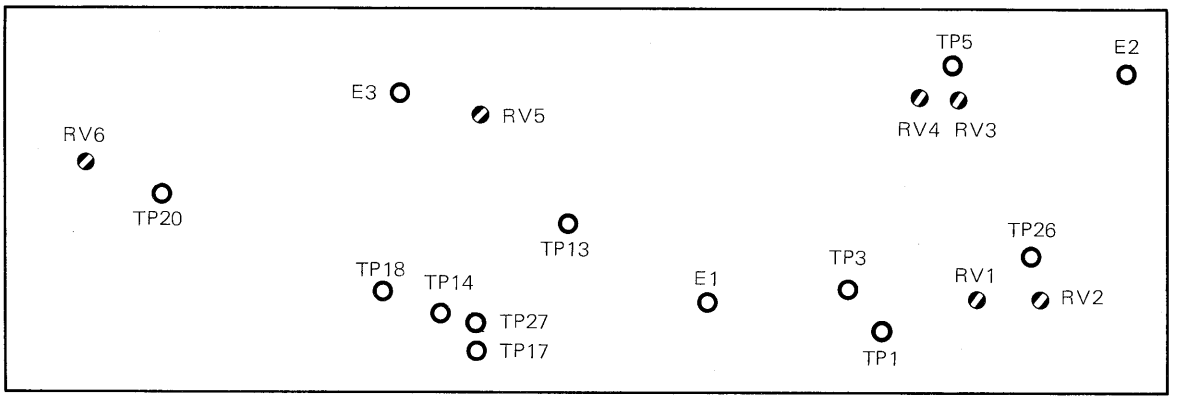
4-6. SPINDLE SERVO SYSTEM ADJUSTMENT

[Equipment Required]

- Reference disc, REF-4-12AM-S (8-847-016-00)
- Remote control unit, RM2001 or RM1002
- Oscilloscope dual trace
- DC voltmeter
- Picture monitor

[Adjustment Locations]

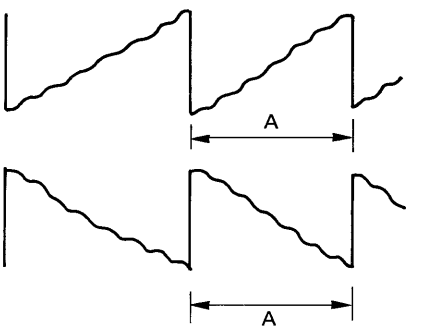
SV-65 board (soldering side)



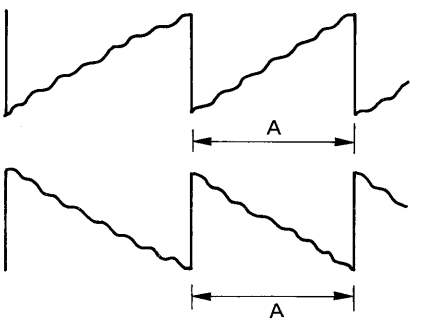
4-6-1. Reference Voltage Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • Search for frame 40,000. • STILL mode.	TP18/SV-65 5.0 ± 0.1 Vdc	RV5/SV-65

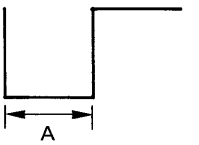
4-6-2. CAV-FG Mode Speed Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • Short TP20 to E3 on the SV-65 board. (compulsory FG mode)	TP13/SV-65 TRIG; INT (Either waveform will do.)  A = more than 100 ms Note: It takes about 15 seconds, until the period is stabilized.	◐ RV6/SV-65

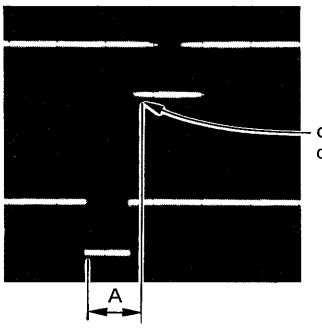
4-6-3. H Mode Speed Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • Short TP14 to E3 on the SV-65 board. (H-phase off) • Short TP17 to E1 on the SV-65 board. (V-phase off)	TP13/SV-65 TRIG; INT (Either waveform will do.)  A = more than 100 ms Note: It takes about 15 seconds, until the period is stabilized.	◐ RV3/SV-65

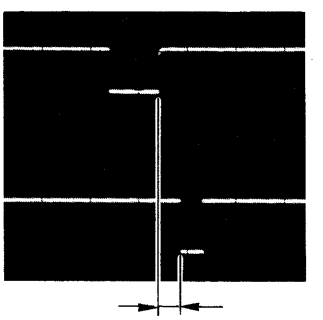
4-6-4. V-Lock Phase Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • Short TP14 to E3 on the SV-65 board. (H-phase off) • Short TP27 to E1 on the SV-65 board. (V-phase on)	TP26/SV-65 TRIG; TP4/SV-65  A = 65 ± 2 μs	◐ RV2/SV-65

4-6-5. H-Lock Phase Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • Search for frame 27,000. • STILL mode.	CHOP mode TRIG; TP4/SV-65 TP1/SV-65 TP3/SV-65  A = 6.4 ± 1.0 μs	◐ RV1/SV-65

4-6-6. Noise Eliminate MMV Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • PLAY or STILL mode	CHOP mode TRIG; TP4/SV-65 TP5/SV-65 TP3/SV-65  A = 4.5 ± 0.5 μs	◐ RV4/SV-65

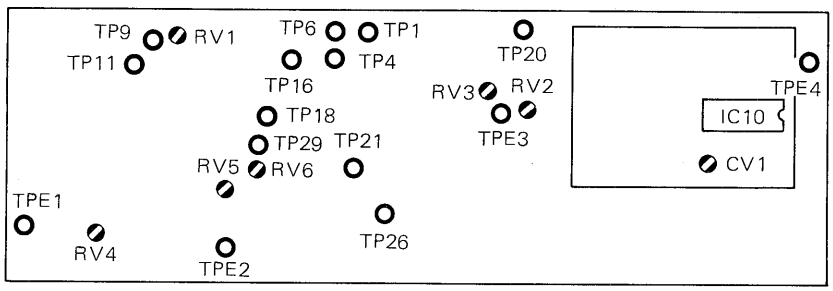
4-7. TBC SYSTEM ADJUSTMENT

[Equipment Required]

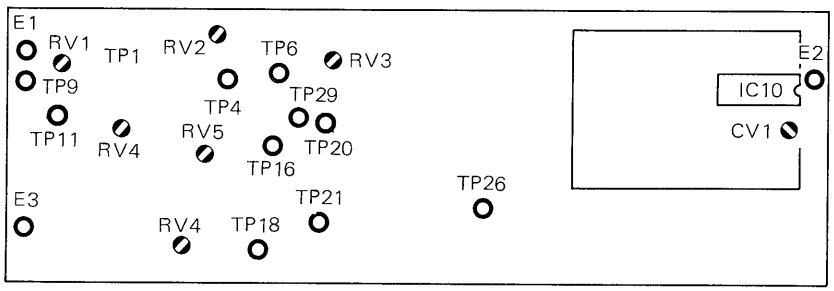
- Reference disc, REF-4-12AM-S (8-847-016-00)
- Reference disc, F1 (8-847-018-00)
- Remote control unit, RM-2001 or RM-1002
- Oscilloscope dual trace
- Frequency counter
- Picture monitor
- B/W picture monitor

[Adjustment Locations]

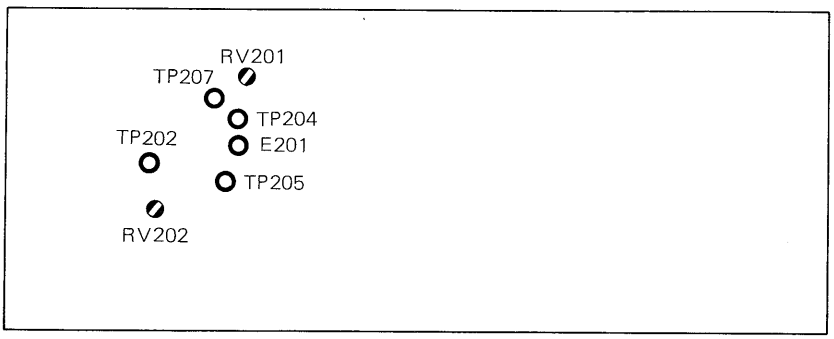
SV-69 board (-13) (soldering side)



SV-69 board (-12) (soldering side)



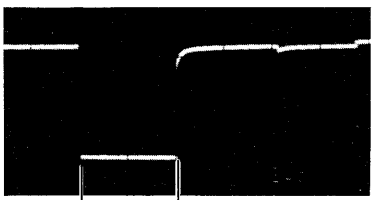
SA-16 board (soldering side)



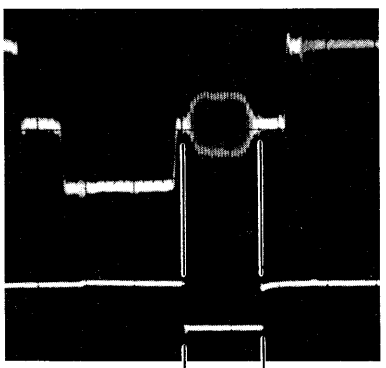
4-7-1. Int. SG Clock Adjustment

Conditions for adjustment	Specifications	Adjustments
• Any mode.	IC10-22 pin/SV-69 3,579, 545 ± 5 Hz	◐ CV1/SV-69

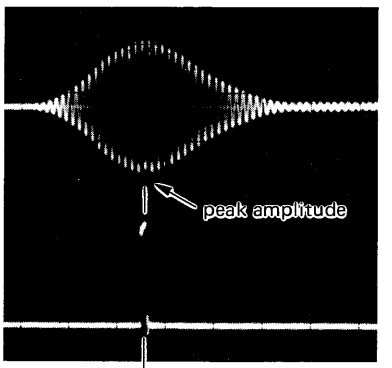
4-7-2. 1/2H Reject MMV Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • PLAY or STILL mode	TP29/SV-69 TRIG; TP29/SV-69  A = 4 ± 0.1 μs	◐ RV6/SV-69

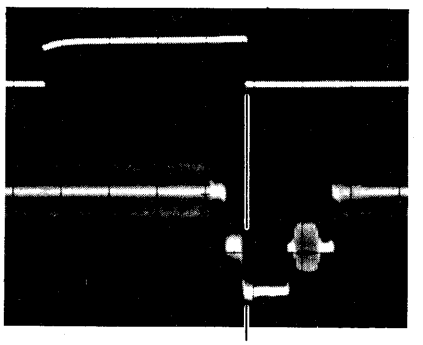
4-7-3. Burst Gate Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • PLAY or STILL mode	CHOP mode TRIG; TP20/SV-69 TP26/SV-69 TP20/SV-69  To be in phase	◐ RV2/SV-69

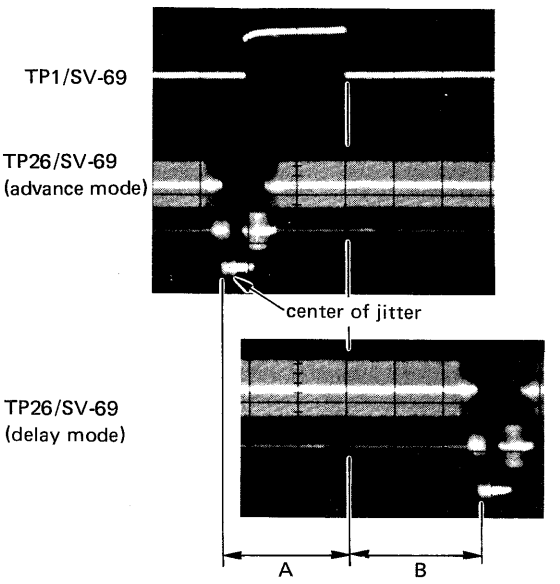
4-7-4. CBH Gate Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • PLAY or STILL mode	CHOP mode TRIG; TP20/SV-69 TP21/SV-69 TP18/SV-69  To be in phase	⊘ RV5/SV-69

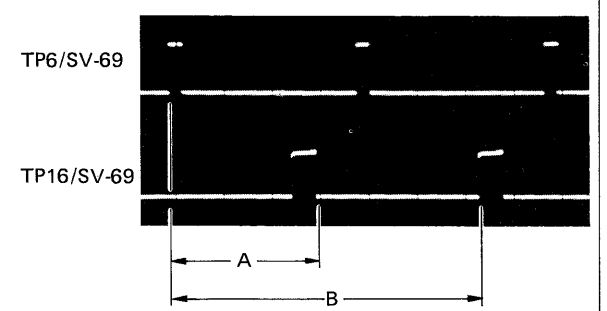
4-7-5. Lock Phase Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • PLAY or STILL mode.	CHOP mode TRIG; TP1/SV-69 TP1/SV-69 TP26/SV-69  To be in phase (≦0.5 μs)	⊘ RV1/SV-69

4-7-6. Limiter Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • PLAY or STILL mode. • Short TP9 to E1 (TBC advance mode) or TP11 to E1 (TBC delay mode) on the SV-69 board.	CHOP mode TRIG; TP1/SV-69  A ≧ 20 μs B ≦ 30 μs |A−B| ≦ 3 μs	◐ RV4/SV-69

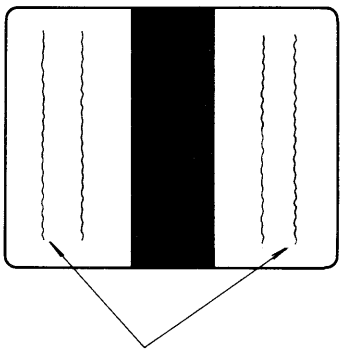
4-7-7. Dropout Delay Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • PLAY or STILL mode. • Short TP4 to E1 on the SV-69 board. (TBC dropout mode)	CHOP mode TRIG; TP16/SV-69  A = 50 ± 5 μs B = 100 to 110 μs	◐ RV3/SV-69

4-7-8. Skew Threshold Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • Press the SCAN button so that the READING LOCATION indicates scale 2. • PLAY mode.	Confirm the dc levels at TP205 and TP202 on the SA-16 board. $TP202 = \frac{TP205}{4} \pm 5\%$	◐ RV202/SA-16

4-7-9. Skew Balance Adjustment

Conditions for adjustment	Specifications	Adjustments
• F1 disc. • Search for frame 899. • Connect temporarily 1.2kΩ resister between TP204 and TP207 on the SA-16 board. (make narrow the dead zone) • STILL mode	B/W Picture Monitor  Minimize the cross-talk. (Equalize the right and left cross-talk.) Monitor Controls Brighten the picture with the BRIGHTNESS control. Intensify the contrast of picture with the CONTRAST control.	◐ RV201/SA-16

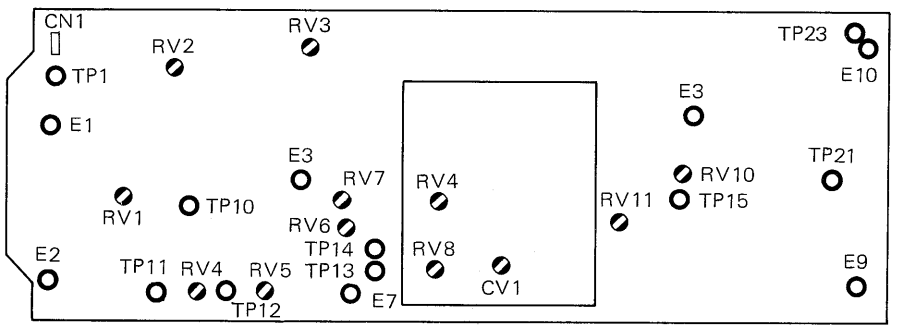
4-8. VIDEO SYSTEM ADJUSTMENT

[Equipment Required]

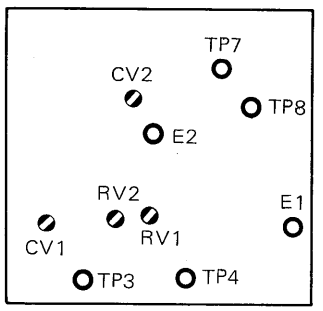
- Reference disc, REF-4-12AM-S (8-847-016-00)
- Signal generator (Sweep generator) ~ 5.4 MHz
- Remote control unit, RM-2001 or RM-1002
- Vector scope
- Oscilloscope dual trace
- Picture monitor

[Adjustment Locations]

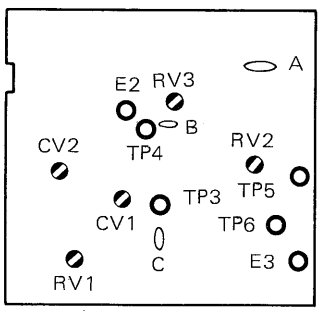
DM-45 board (soldering side)



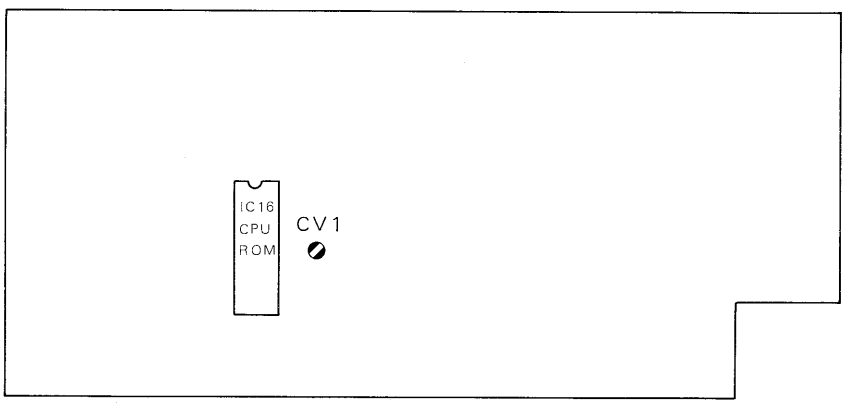
MC-25 board (-13) (soldering side)



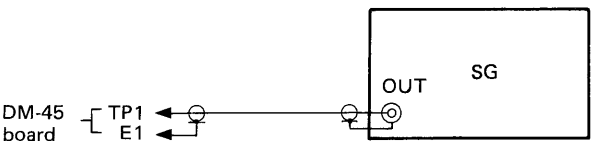
MC-25 board (-11, -12) (soldering side)



SY-30 board (component side)



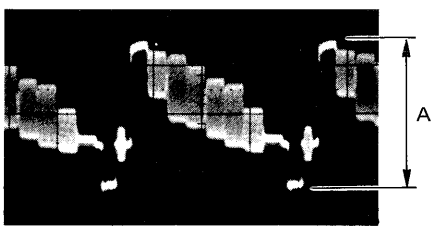
4-8-1. Dropout Detector Adjustment



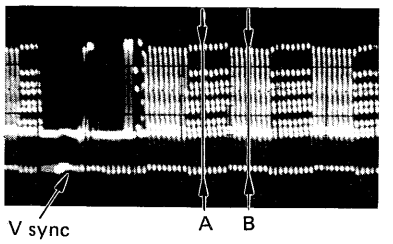
5.2 MHz; 0.2 Vp-p
5.3 MHz; 0.2 Vp-p
5.4 MHz; 0.2 Vp-p

Conditions for adjustment	Specifications	Adjustments
• POWER on status • Disconnect the CN1/DM-45 and connect the SG signal as shown in above.	SG freq. / TP10/DM-45 5.2 MHz / "H" level 5.3 MHz / "H/L" mixed level 5.4 MHz / "L" level	◐ RV2/DM-45

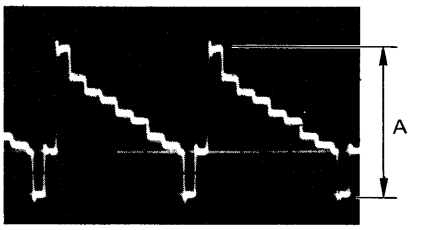
4-8-2. Demodulated Video Level Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • Search for frame 27,000. • STILL mode	TP11/DM-45 TRIG; INT  A = 1.2 ± 0.05 V	◐ RV1/DM-45

4-8-3. DOC Video Level Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • Search for frame 27,000. • STILL mode. • Short TP10 to TP23 (CN5-10 PIN) on the DM-45 board. (dropout mode by FG signal)	TP11/DM-45 TRIG; TP17/DM-45  A = B ± 0.05 V	◐ RV3/DM-45

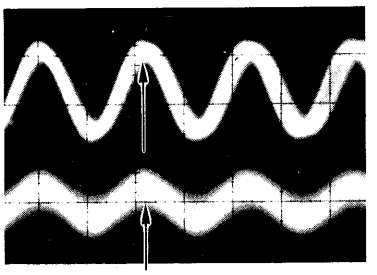
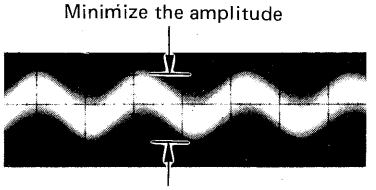
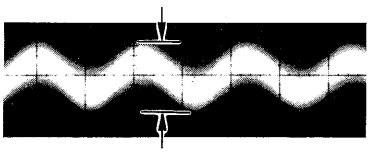
4-8.4. Frame Data Separator Video Level Adjustment

Condition for adjustment	Specifications	Adjustments
• REF4 disc. • Search for frame 27,000. • STILL mode.	TP12/DM-45 TRIG; INT  A = 3.0 ± 0.1 V	◐ RV4/DM-45

4-8.5. Wormy Beat Canceller Adjustment

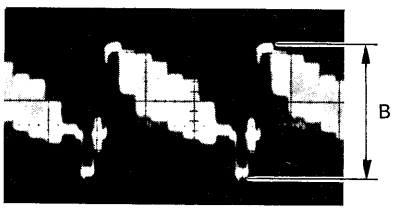
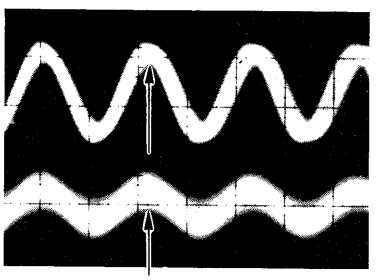
Applicable S/N 31,051 and higher (UC). 20,251 and higher (J).

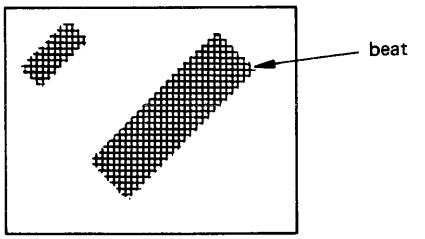
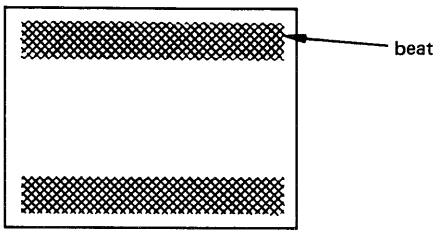
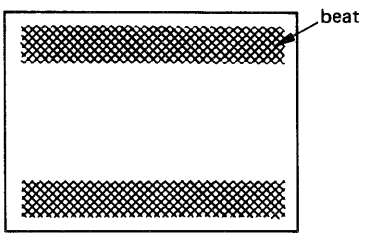
Note: This adjustment is required only when the beat is remarkable.

Condition for adjustment	Specifications	Adjustments
(1) Phase Adjustment-1 • Playback where the beat is remarkable on the disc. • Short TP7 to TP8 on the MC-25 board. (open the loop)	CHOP mode TP3/MC-25 TP4/MC-25  To be in phase	◐ CV1/MC-25
(2) Offset Adjustment • Playback the outer part of REF4 disc.	TP4/MC-25 Minimize the amplitude  Confirm that the beat noise is not shown on the monitor picture.	◐ RV3/MC-25
(3) Phase Adjustment-2 • Playback where the beat is remarkable on the disc. • Turn RV1/MC-25 to fully CCW ↺.	TP4/MC-25  Minimize the amplitude Confirm that the slantwise beat is not shown on the monitor picture.	◐ CV2/MC-25

4-8-5. Wormy Beat Canceller Adjustment

Applicable S/N up to 31,050 (UC).
up to 20,250 (J).

Condition for adjustment	Specifications	Adjustments
(1) Preparation Change the soldering short points as mentioned. In using a soldering iron, turn off the power switch.	Short point on the MC-25 board. Ⓐ -1: open Ⓐ -2: short Ⓑ : open Ⓒ : open	
(2) Amp Gain Adjustment • REF4 disc. • Search for frame 27,000. • STILL mode.	ALT mode TP6/MC-25 TP5/MC-25  B = A ± 5%	◐ RV2/MC-25
(3) Phase Adjustment-1 • Playback where the beat is remarkable on the disc.	CHOP mode TP3/MC-25 TP4/MC-25  To be in phase	◐ CV1/MC-25

(4) Offset Adjustment • Playback the outer part of REF4 disc.	Monitor Picture  Minimize the beat on monitor screen.	◐ RV3/MC-25
(5) Phase Adjustment-2 • Playback where the beat is remarkable on the disc. • Turn RV1/MC-25 to fully CW ↻.	Monitor Picture  Minimize the slantwise beat on monitor screen.	◐ CV2/MC-25
(6) Closed Loop Check • Put back the soldering short point as mentioned. In using a soldering iron, turn off the power switch. • Turn RV1/MC-25 to CCW ↺ about 90 degrees. • Playback where the beat is remarkable on the disc.	Short point on the MC-25 board. Ⓐ -1: short Ⓐ -2: open Ⓑ : short Ⓒ : short Monitor Picture  Confirm that the slantwise beats are not shown on the picture.	

< **Notice** >

1. Beat

• The beat looks like as Fig-1 when there is no audio signal in the disk.

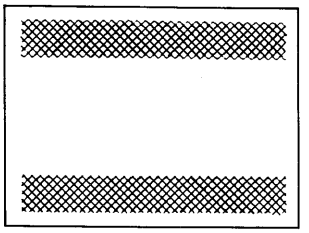


Fig-1

• The beat looks like as Fig-2 when there is audio signal in the disk.

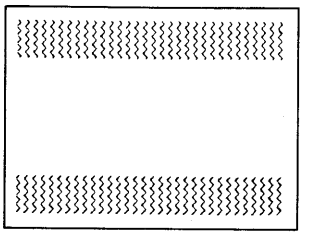
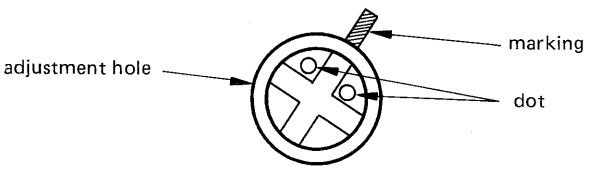


Fig-2

2. Adjusted position of VRs on MC-25 Board.

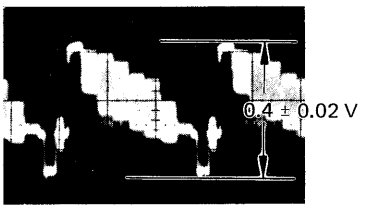
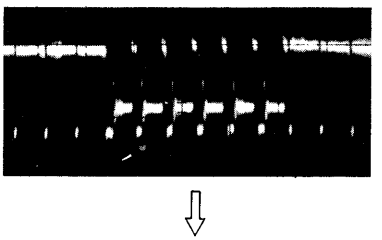
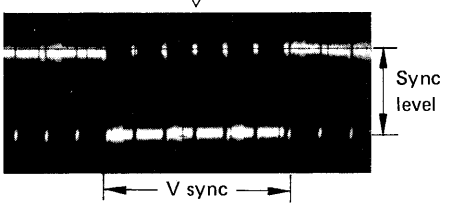
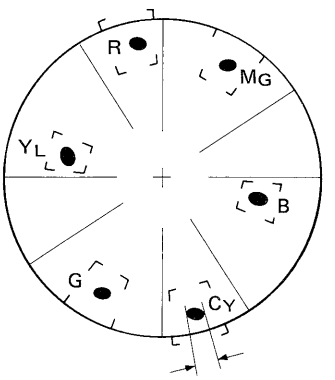
Adjusted position is marked on the following serial numbers machine at the factory.
(The adjustment effect is visible only when the disc which the beat is noticeable is used. So do not change adjusted position using the disc which the beat is not noticeable.)

Soldering Side

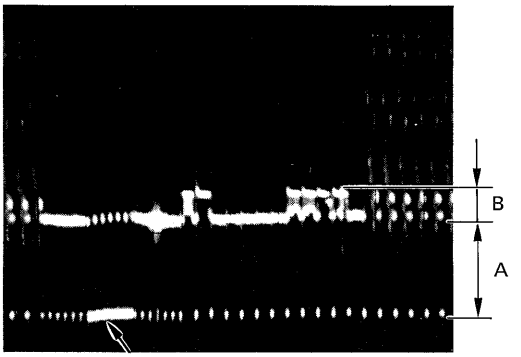


Serial No.
LDP-2000 (J) . . . . . 20251 and higher
LDP-2000 (UC) . . . 40101 and higher

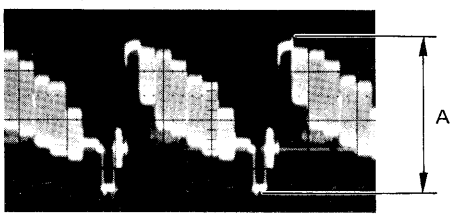
4-8-6. Variable Delay Line (CCD) Adjustment

Condition for adjustment	Specifications	Adjustments
(1) CCD Input Level Adjustment • REF4 disc. • Search for frame 27,000. • STILL mode.	TRIG; INT TP13/DM-45 (CCD-1) TP14/DM-45 (CCD-2)  	◐ RV6/DM-45 (CCD-1) ◐ RV7/DM-45 (CCD-2)
(2) CCD Bias Adjustment • REF 4 disc. • Search for frame 27,000. • STILL mode	TRIG; TP17/DM-45 TP15/-DM-45 NG  OK  	◐ RV8/DM-45 (CCD-1) ◐ RV9/DM-45 (CCD-2) Set the RV8 to fully CCW ↺ and turn slowly CW ↻ until the distortion in the V sync interval is disappeared. Set the RV9 by the same way as RV8.
(3) CCD Bias Check • STEP PLAY at the any frame, that is obtained the large variation of APL between next frame, such as REF4 disc frame 22,201 to 22,202.	Confirm that the distortion does not appear in the V sync interval, and sync level does not change at the frame advances.	If spec. are not met, adjust finely RV8 and RV9.
(4) CCD Clock Balance Adjustment • REF4 disc. • Search for frame 27,000. • STILL mode.	Vector Scope  Minimize the each bright spot's spread.	◐ CV1/DM-45

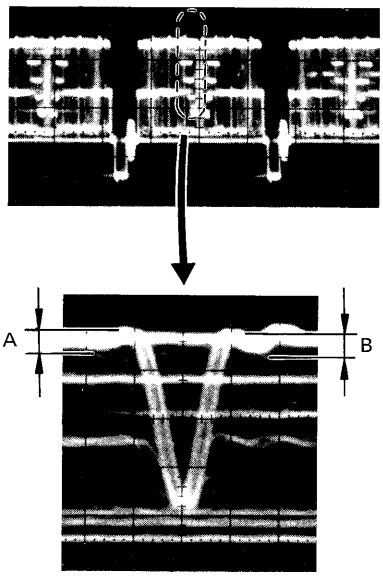
4-8-7. Frame Data Slice Adjustment

Condition for adjustment	Specifications	Adjustments
• REF4 disc. • Search for frame 27,000. • STILL mode.	TP21/DM-45 TRIG; TP17/DM-45  A : B = 40 : 10 ± 3	◐ RV5/DM-45

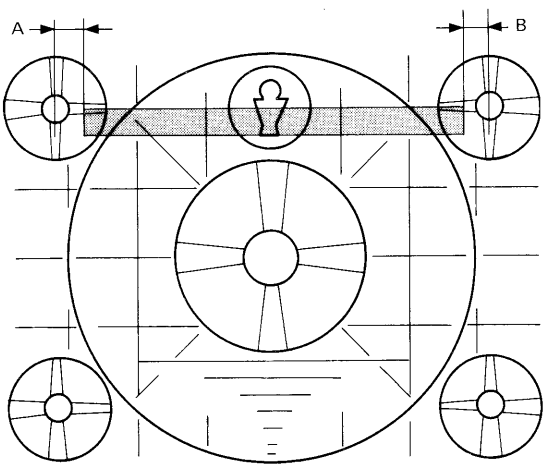
4-8-8. Video Out Level Adjustment

Condition for adjustment	Specifications	Adjustments
• REF4 disc. • Search for frame 27,000 • STILL mode.	VIDEO OUT connector TRIG; INT  A = 1.0 ± 0.05 V Note: VIDEO OUT connector should be terminated by 75 Ω.	◐ RV11/DM-45

4-8-9. Waveform Characteristic Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • Search for frame 26,000 • STILL mode.	TP21/DM-45 TRIG; TP17/DM-45  A = B ± 5%	◐ RV10/DM-45

4-8-10. Index Position Adjustment

Conditions for adjustment	Specifications	Adjustments
• FEF4 disc. • Search for frame 4,200. • Press the INDEX button to display the index on monitor picture.	Monitor Picture  $B = A \pm \frac{A}{2}$	◐ CV1/SY-30

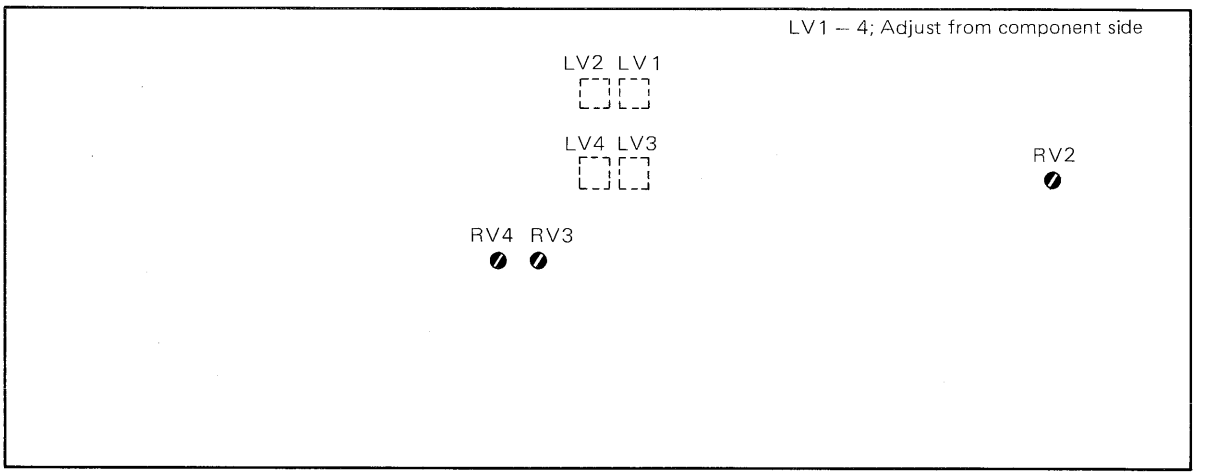
4-9. AUDIO SYSTEM ADJUSTMENT

[Equipment Required]

- Reference disc, REF4-12AM-S (8-847-016-00)
- Audio level meter
- Distortion meter
- Wow flutter meter

[Adjustment Locations]

SA-16 board (soldering side)



4-9-1. Demodulator Linearity Adjustment

Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • FWD PLAY mode at the frame 4,200 to 5,300	LINE OUT jack (CH-1/L or CH-2/R) Note: LINE OUT jacks should be terminated by 47kΩ. (1) Maximize the reading of level meter. (2) Minimize the reading of distortion meter. Repeat alternately the step (1) and (2) two or three times.	 ⊘ LV1/SA-16 (CH-1/L) ⊘ LV3/SA-16 (CH-2/R) ⊘ LV2/SA-16 (CH-1/L) ⊘ LV4/SA-16 (CH-2/R)

4-9-2. Line Out Level Adjustment

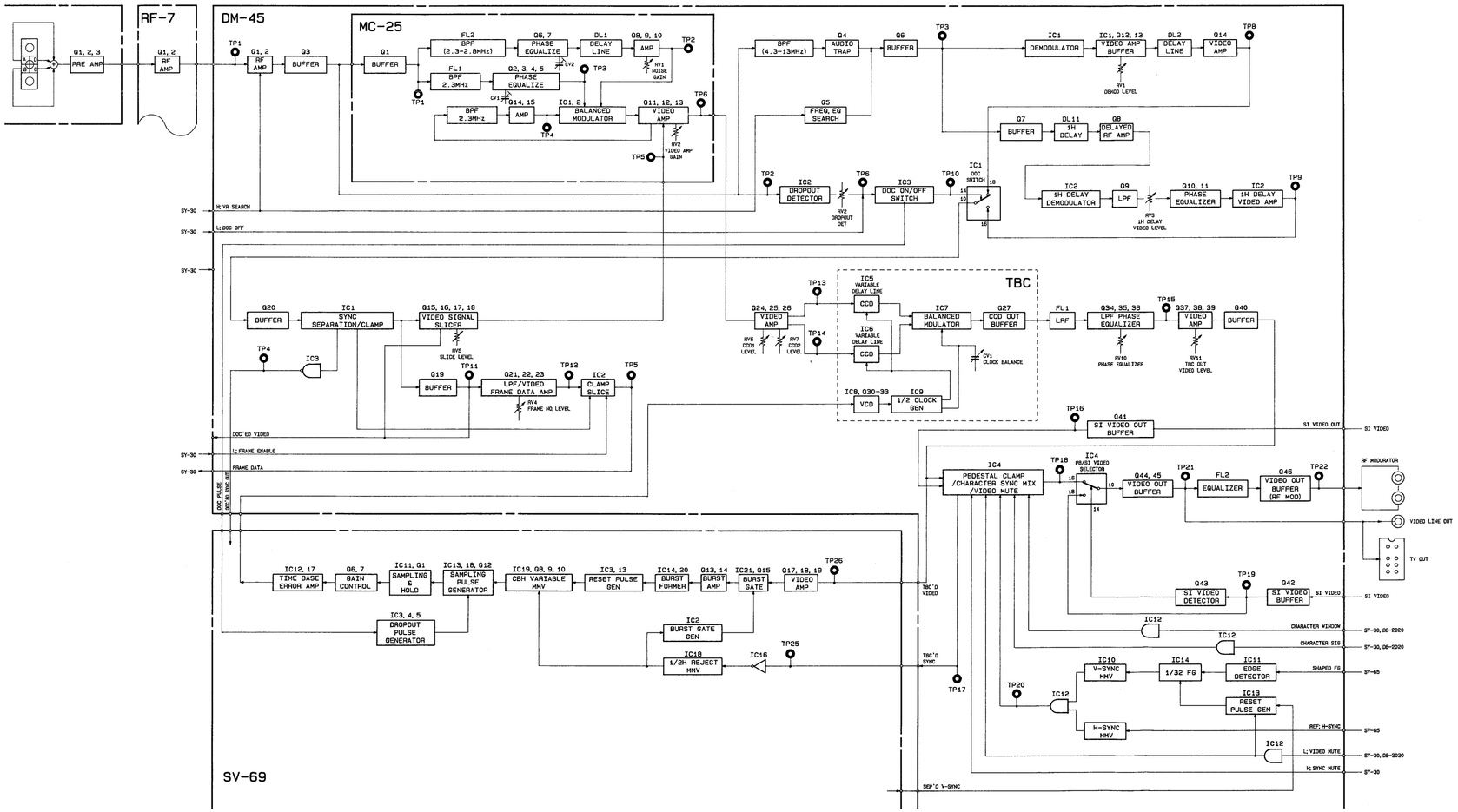
Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • FWD PLAY mode at the frame 4,200 to 5,300.	LINE OUT jack (CH-1/L or CH-2/R) Note: LINE OUT jacks should be terminated by 47kΩ. 2.2 ± 0.5 dBs	⊘ RV3/SA-16 (CH-1/L) ⊘ RV4/SA-16 (CH-2/R)

4-9-3. TBC Gain Adjustment

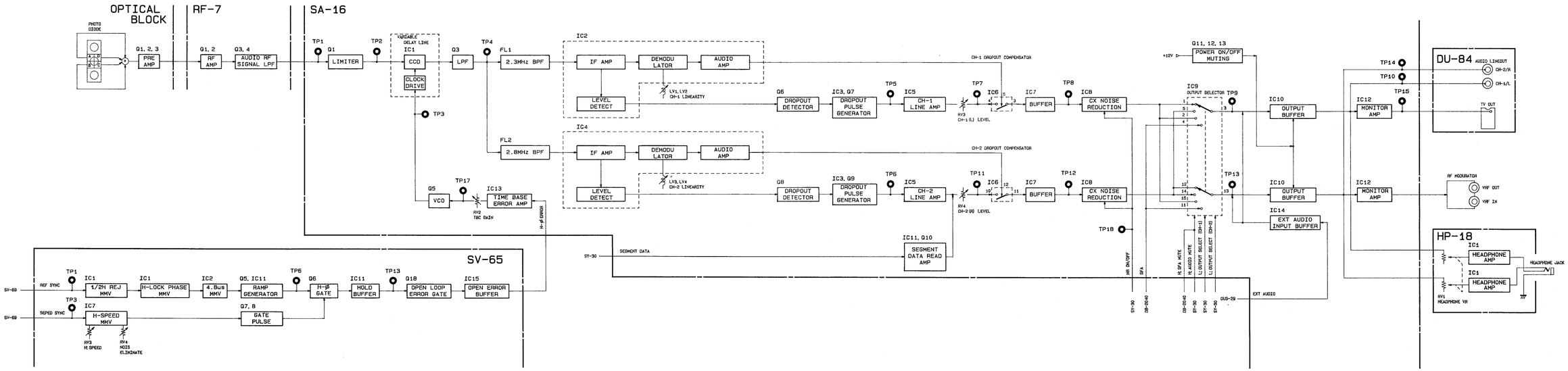
Conditions for adjustment	Specifications	Adjustments
• REF4 disc. • FWD PLAY mode at the frame 300 to 1,700.	LINE OUT jack (CH-1/L or CH-2/R) Note: LINE OUT jacks should be terminated by 47 kΩ. Minimize the reading of wow flutter meter.	◐ RV2/SA-16

SECTION 5
BLOCK DIAGRAMS

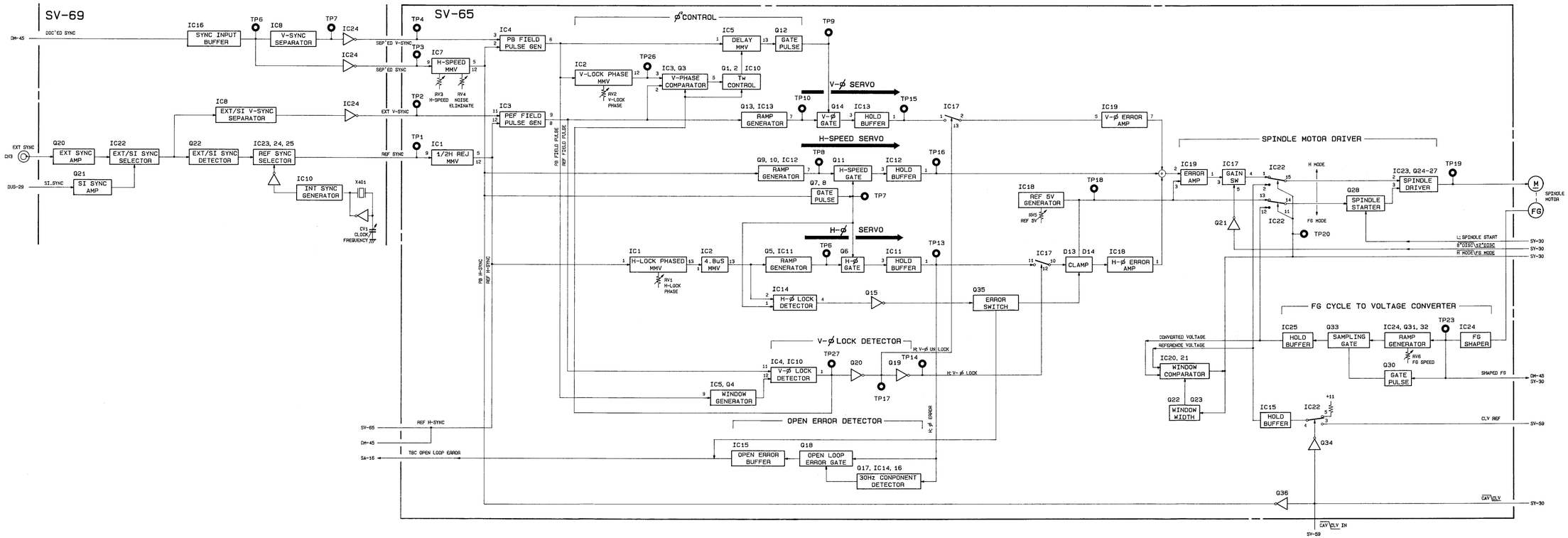
VIDEO SYSTEM BLOCK DIAGRAM



AUDIO SYSTEM BLOCK DIAGRAM

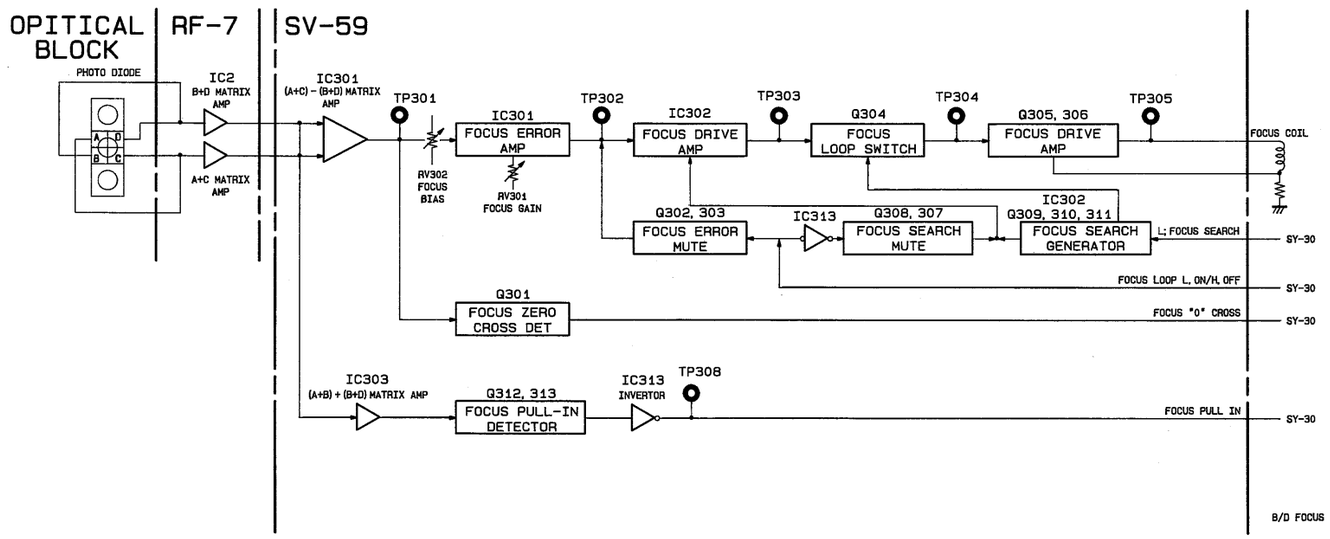


SPINDLE SERVO SYSTEM BLOCK DIAGRAM

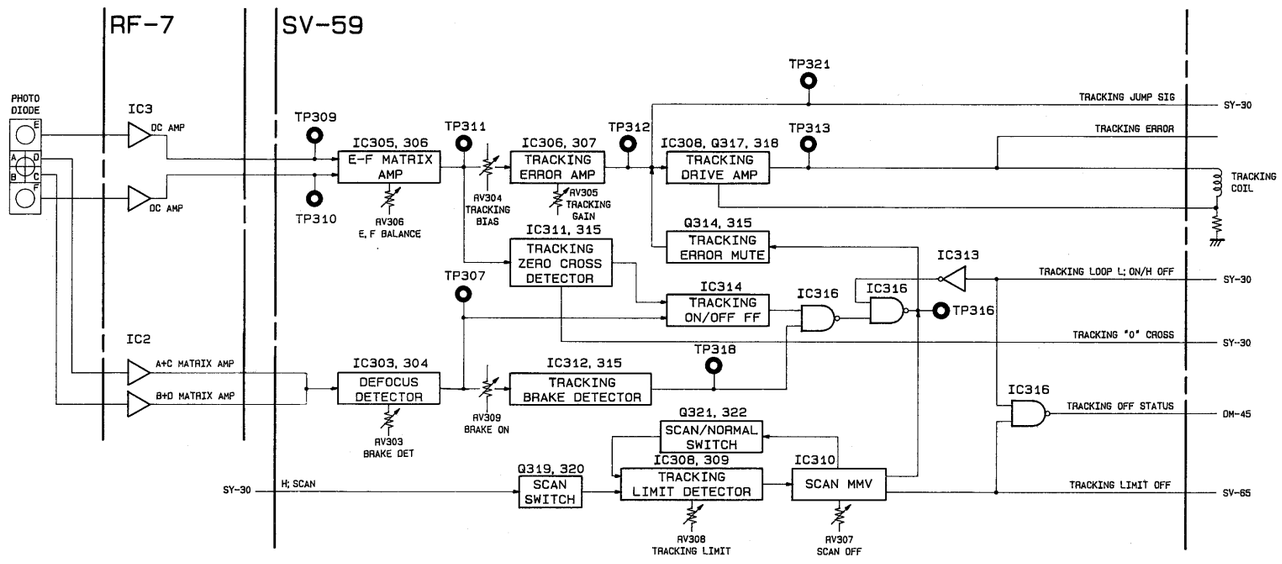


FOCUS SERVO

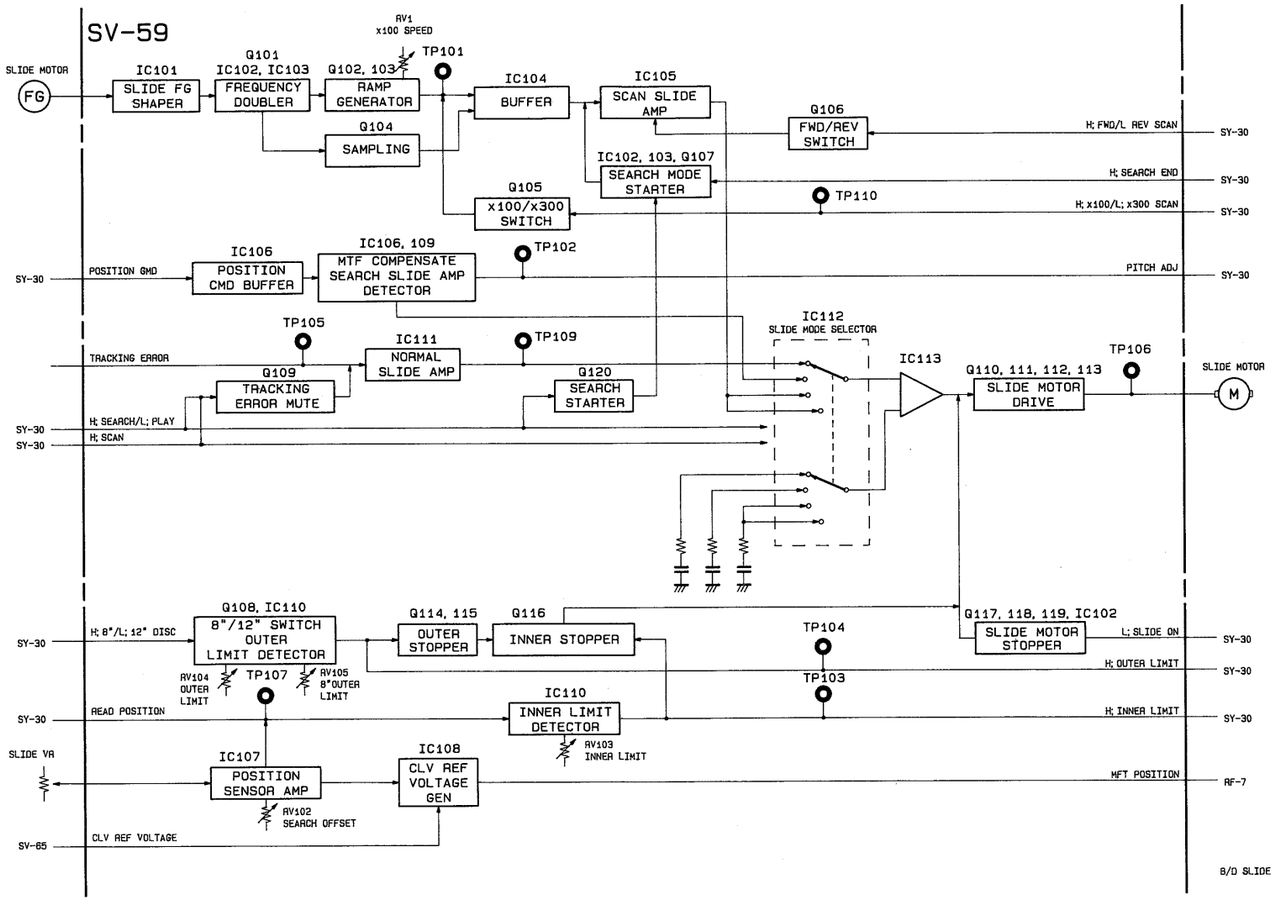
FOCUS SERVO SYSTEM BLOCK DIAGRAM



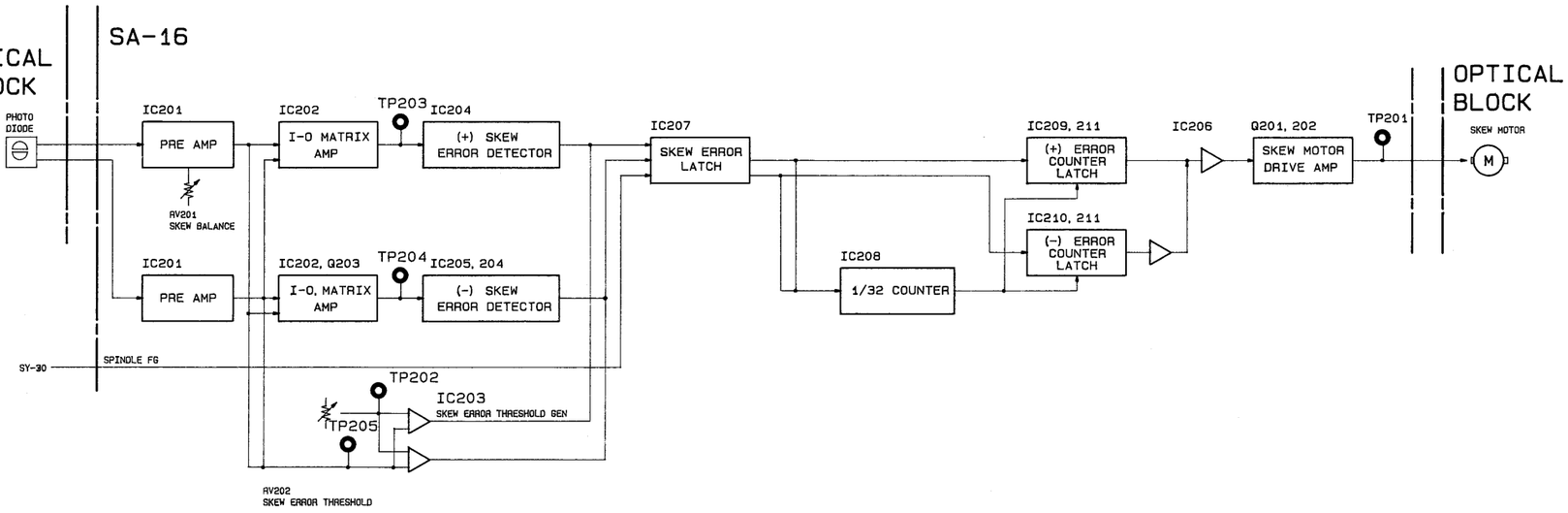
TRACKING SERVO SYSTEM BLOCK DIAGRAM



SLIDE SERVO SYSTEM BLOCK DIAGRAM



SKEW SERVO SYSTEM BLOCK DIAGRAM



SECTION 6
SEMICONDUCTOR ELECTRODES

SEMICONDUCTOR ELECTRODES

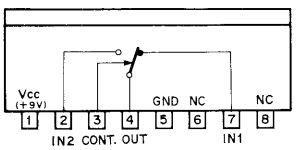
The circuit diagram of each IC is obtained from the IC data book published by the manufacturer.

Type	Page
IC	
CX20061	6-3
CX23040	6-3
CXD1019S	6-3
HA12043	6-4
HA12411	6-4
HD14011BP	6-4
HD14040BP	6-4
HD14052BP	6-5
HD14053BP	6-5
HD14066BP	6-5
HD14069UBP	6-5
HD14538BP	6-5
HD14584BP	6-5
HD68P01V07-1	6-6
HN482732AG-30	6-9
IR2406G	6-6
LM311P	6-6
M51480P	6-7
M51481P	6-7
M54543L	6-7
MB84011B	6-4
MB84013B	6-7
MB84051B	6-7
MB84052B	6-5
MB84053B	6-5
MB84069UB	6-5
MB88201-173N	6-8
MB88303	6-8
MBM2732A-30Z	6-9
MBM2732A-35Z	6-9
MC14538BCP	6-5
MC1496P	6-9
MSM4052BRS	6-5
NE5532P	6-9
NJM2903D	6-9
NJM4558D-D	6-9
NJM78L09A	6-9
NJM79L05A	6-9
SN16913P	6-9
SN74LS00N	6-9
SN74LS08N	6-10
SN74LS10N	6-10
SN74LS123N	6-10
SN74LS221N	6-10
SN74LS74AN	6-10
SN74S74N	6-10
SN75107AN	6-10
SN75188N	6-10
SN75189AN	6-11
TA78L005AP	6-11
TA78L008AP	6-11
TC4011BP	6-4
TC4012BP	6-11
TC4013BP	6-11
TC4016BP	6-5
TC40175BP	6-11
TC4024BP	6-11
TC4030BP	6-12
TC4040BP	6-4
TC4049BP	6-12
TC4051BP	6-7
TC4052BP	6-5
TC4053BP	6-5
TC4066BP	6-5
TC4069UBP	6-5
TC40H000P	6-12
TC40H004P	6-12
TC40H157P	6-12
TC5003P	6-12
TC504013BP	6-11
TL062CP	6-13
TL082CP	6-13
TL8608P	6-13
μPC358C	6-13
μPC4082C	6-13
μPC4558C	6-9
μPC78L05A	6-13
μPC7905H	6-13
μPD1519AG	6-14
μPD4011BC	6-4
μPD4024BC	6-11
μPD4030BC	6-12
μPD4049UBC	6-12
μPD4051BC	6-7
μPD4052BC	6-5
μPD4053BC	6-5
μPD4066BC	6-5
μPD4069UBC	6-5
μPD4584BC	6-5
μPD8243C	6-14

Type	Page
Transistor	
2SA1005	6-15
2SA1048	6-15
2SA1115	6-15
2SA1175	6-15
2SA1184	6-15
2SA1206	6-15
2SA564	6-15
2SA844	6-15
2SA933S	6-15
2SB553	6-15
2SB734	6-15
2SB740	6-15
2SB825	6-15
2SC1061	6-15
2SC1363	6-15
2SC1364	6-15
2SC1474	6-15
2SC1475	6-15
2SC1740S	6-15
2SC1826	6-15
2SC2458	6-15
2SC2603	6-15
2SC2690A	6-15
2SC2785	6-15
2SC2824	6-15
2SC2878	6-15
2SC2901	6-15
2SC3068	6-15
2SC403C	6-15
2SC403SP	6-15
2SC641K	6-15
2SD1061	6-15
2SD1135	6-15
2SD313HP	6-15
2SD553	6-15
2SD773	6-16
2SD774	6-16
2SD788	6-15
2SD789	6-15
2SK184	6-16
2SK523	6-16
DTA114ES	6-16

Type	Page
Diode	
GL-4HD5	6-16
GL-9PR2	6-16
LT-9010D	6-16
ON1110	6-16
PH302B	6-16

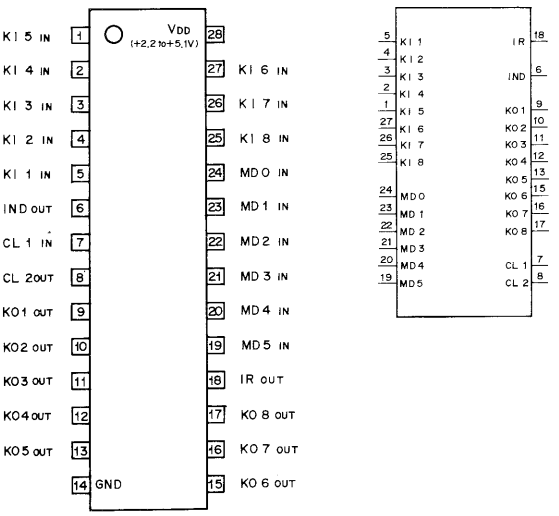
CX20061 (SONY)
ANALOG SWITCH
— SIDE VIEW —



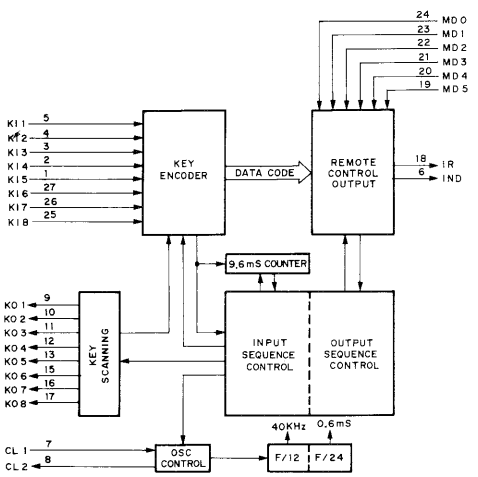
CONT.	SW
0	
1	

0 ; LOW LEVEL
1 ; HIGH LEVEL

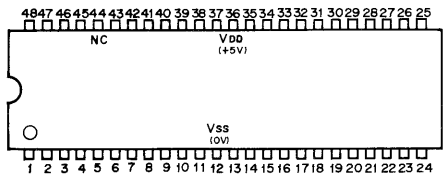
CX23040 (SONY)
C-MOS STANDARD CODE GENERATOR FOR INFRARED REMOTE CONTROL SYSTEM
— TOP VIEW —



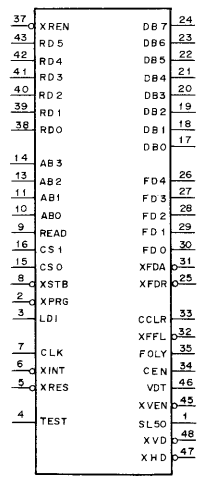
CL 1 ; EXTERNAL OSC IN
CL 2 ; OSC OUT
IND ; INDICATION OUT
IR ; REMOTE CONTROL OUT
KI1-KI 8 ; KEY MATRIX IN
KO1-KO 8 ; KEY MATRIX OUT
MD0-MD5 ; MODE SELECT (WORD CODE) IN



CXD1019S (SONY)
C-MOS FRAME NUMBER DECODER FOR VIDEODISC PLAYER
— TOP VIEW —

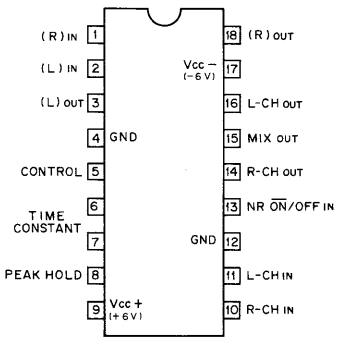


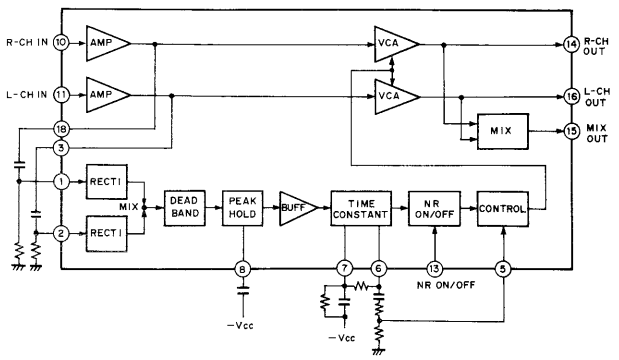
PIN NO.	IN	OUT	SYMBOL	PIN NO.	IN	OUT	SYMBOL	PIN NO.	IN	OUT	SYMBOL	PIN NO.	IN	OUT	SYMBOL
1	O		SL50	13	O		AB2	25		O	XFDR	37	O		XREN
2		O	XPRG	14	O		AB3	26	O	O	FD4	38	O		RDO
3		O	LDI	15	O		CS0	27	O	O	FD3	39	O		RD1
4	O		TEST	16	O		CS1	28	O	O	FD2	40	O		RD2
5	O		XRES	17	O	O	DB0	29	O	O	FD1	41	O		RD3
6		O	XINT	18	O	O	DB1	30	O	O	FD0	42	O		RD4
7	O		CLK	19	O	O	DB2	31	O		XFDA	43	O		RD5
8	O		XSTB	20	O	O	DB3	32		O	XFFL	44	—	—	—
9	O		READ	21	O	O	DB4	33	O		CCLR	45		O	XVEN
10	O		ABO	22		O	DB5	34	O		CEN	46	O		VDT
11	O		AB1	23		O	DB6	35	O		FOLY	47	O		XHD
12	—	—	Vss	24	O	O	DB7	36	—	—	VDD	48	O		XVD



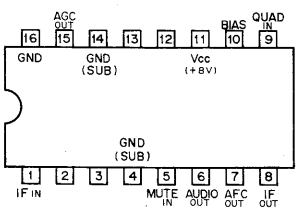
ABO – 3	ADDRESS BUS DATA IN
CCLR	FIELD COUNTER CLEAR IN
CEN	FIELD COUNTER ENABLE IN
CLK	CLOCK(4.9152MHz) IN
CS0, 1	CHIP SELECT IN
DBO–7	DATA BUS DATA IN/OUT
FDO–4	FOCUS TRACKING DATA IN/OUT
FOLY	FRAME NO. DATA SELECT IN
LDI	DISPLAY CONTROL OUT
RDO–5	REMOTE CONTROL DATA IN
READ	DATA BUS READ/WRITE SELECT IN
SL50	625LINE/525LINE SELECT IN
TEST	TEST MODE SELECT IN
VDT	VIDEO DATA IN
XFDA	FOCUS, TRACKING DATA ACKNOWLEDGE IN
XFDR	FOCUS, TRACKING DATA READY OUT
XFFL	1st FIELD FLAG OUT
XHD	HORIZONTAL SYNC IN
XINT	INTERRUPT REQUEST OUT
XPRG	I/O EXPAND CONTROL OUT
XREN	REMOTE CONTROL DATA ENABLE IN
XRES	RESET IN
XSTB	STROBE IN
XVD	VERTICAL SYNC IN
XVEN	20H DETECT SIGNAL OUT

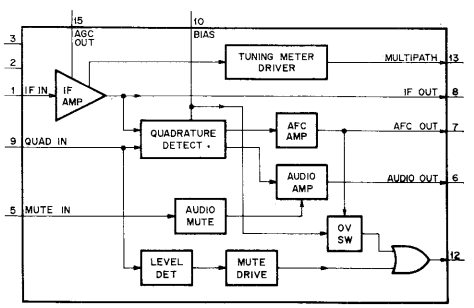
HA12043 (HITACHI)
AUDIO NOISE REDUCTION SYSTEM FOR VIDEO DISC PLAYER
— TOP VIEW —



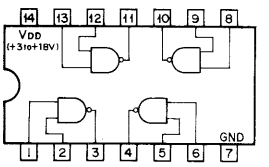


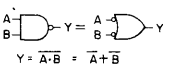
HA12411 (HITACHI)
FM IF AMPLIFIER
QUADRATURE DETECT
AUDIO AMPLIFIER
MUTING
AFC
AGC
TUNING METER DRIVER





HD14011BP (HITACHI)
MB84011B (FUJITSU)
TC4011BP (TOSHIBA)
μPD4011BC (NEC)
C-MOS 2-INPUT NAND GATE
— TOP VIEW —

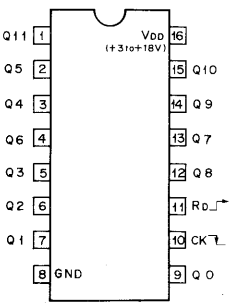


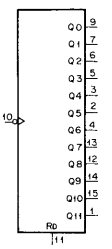


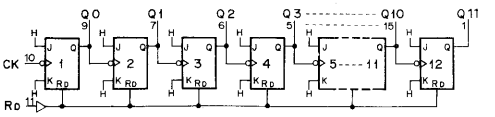
A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

0: LOW LEVEL
1: HIGH LEVEL

HD14040BP (HITACHI)
TC4040BP (TOSHIBA)
C-MOS 12-STAGE RIPPLE CARRY BINARY COUNTER/DRIVER
— TOP VIEW —





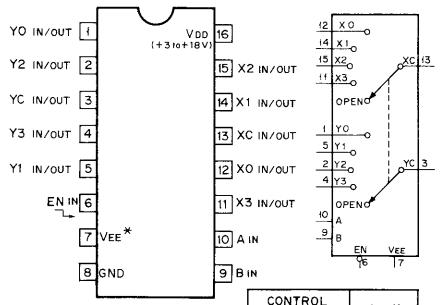


COUNT	Q11	Q10	Q9	Q8	Q7	Q6	Q5	Q4	Q3	Q2	Q1	Q0
0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	1
2	0	0	0	0	0	0	0	0	0	0	1	0
3	0	0	0	0	0	0	0	0	0	0	1	1
4095	1	1	1	1	1	1	1	1	1	1	1	1

RD	Q11 ····· Q0
1	ALL LOW
0	COUNT

0; LOW LEVEL
1; HIGH LEVEL

HD14052BP (HITACHI)
MB84052B (FUJITSU)
MSM4052BRS (OKI)
TC4052BP (TOSHIBA)
uPD4052BC (NEC)
C-MOS 4-CHANNEL MULTIPLEXER/DEMULTIPLEXER
— TOP VIEW —

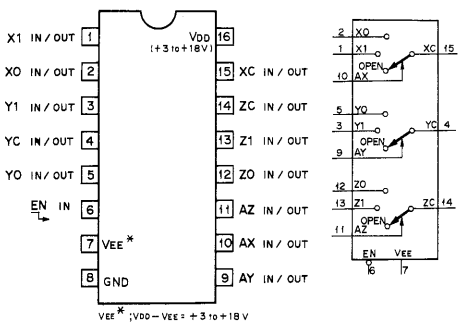


VEE* ; VDD − VEE = +3 to +18V

CONTROL INPUTS			"ON" CHANNEL
EN	B	A	
0	0	0	0
0	0	1	1
0	1	0	2
0	1	1	3
1	X	X	OPEN

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE.

HD14053BP (HITACHI)
MB84053B (FUJITSU)
TC4053BP (TOSHIBA)
uPD4053BC (NEC)
C-MOS 2-CHANNEL MULTIPLEXER/DEMULTIPLEXER
— TOP VIEW —

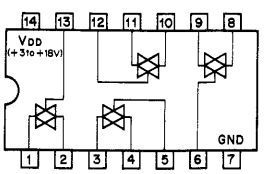


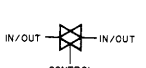
VEE* ; VDD − VEE = +3 to +18V

CONT. INPUTS		ON CHANNEL
EN	A (X_i, Y_i, Z_i)	
0	0	0
0	1	1
1	X	OPEN

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE.

HD14066BP (HITACHI)
TC4016BP (TOSHIBA)
TC4066BP (TOSHIBA)
uPD4066BC (NEC)
C-MOS BILATERAL ANALOG SWITCH
— TOP VIEW —

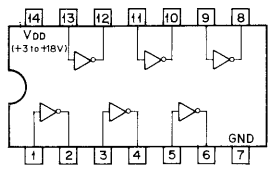


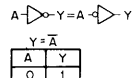


CONTROL	SWITCH
0	OFF
1	ON

0; LOW LEVEL
1; HIGH LEVEL

HD14069UBP (HITACHI)
MB84069UB (FUJITSU)
TC4069UBP (TOSHIBA)
uPD4069UBC (NEC)
C-MOS INVERTER
— TOP VIEW —

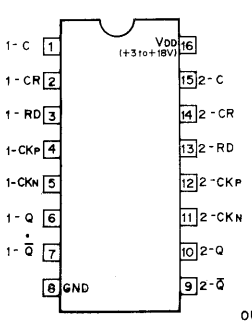




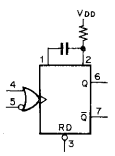
A	Y
0	1
1	0

0; LOW LEVEL
1; HIGH LEVEL

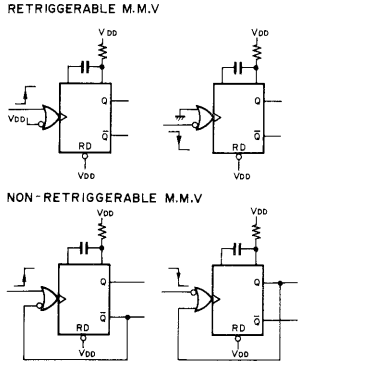
HD14538BP (HITACHI)
MC14538BCP (MOTOROLA)
C-MOS DUAL RETRIGGERABLE/NON-RETRIGGERABLE MONOSTABLE MULTIVIBRATOR
— TOP VIEW —



RETRIGGERABLE M.M.V

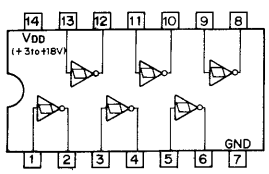


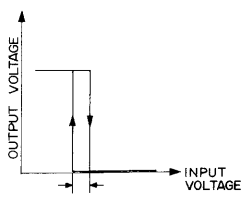
OUTPUT PULSE WIDTH=CR



NON-RETRIGGERABLE M.M.V

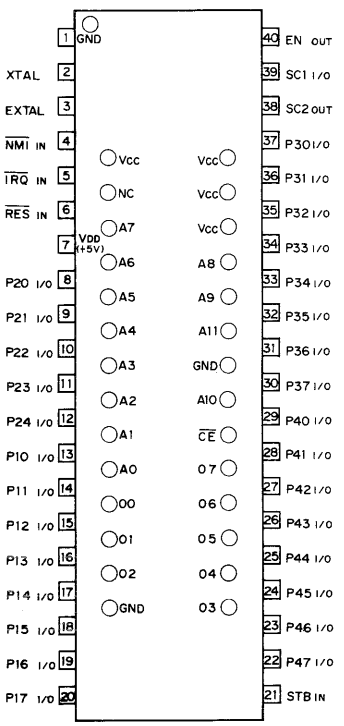
HD14584BP (HITACHI)
uPD4584BC (NEC)
C-MOS SCHMITT TRIGGER INVERTER
— TOP VIEW —

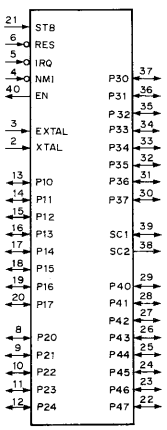




0.4V (VDD=5V)
0.45V(VDD=10V)
0.90V(VDD=15V)

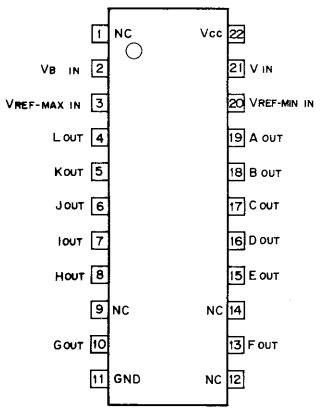
HD68P01V07-1 (HITACHI)
N-MOS 1-CHIP MICROCOMPUTER UNIT
— TOP VIEW —

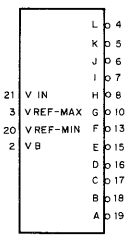


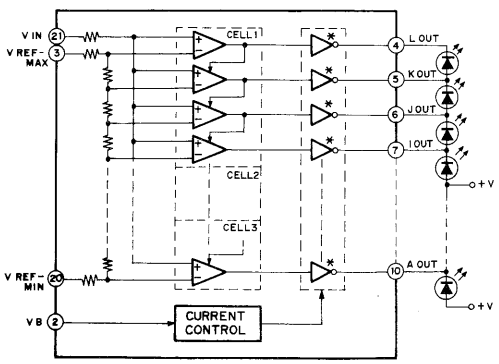


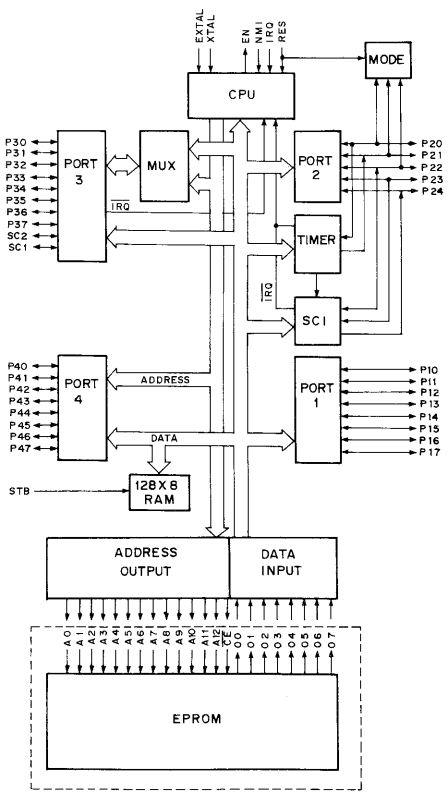
STB ; VDD STANDBY IN
RES ; SYSTEM RESET IN
IRQ ; MASKABLE INTERRUPT REQUEST IN
NMI ; NON-MASKABLE INTERRUPT IN
EN ; ENABLE OUT
EXTAL, XTAL ; CRYSTAL CONNECTION/CLOCK IN
P10- P17 ; I/O PORT 1
P20- P24 ; I/O PORT 2
P30- P37 ; I/O PORT 3
SC1, SC2 ; STROBE CONTROL
P40- P47 ; I/O PORT 4

IR2406G (SHARP)
12-DOT LED DISPLAY DRIVER
— TOP VIEW —

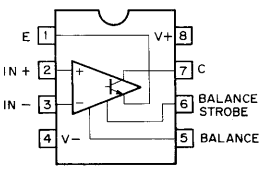




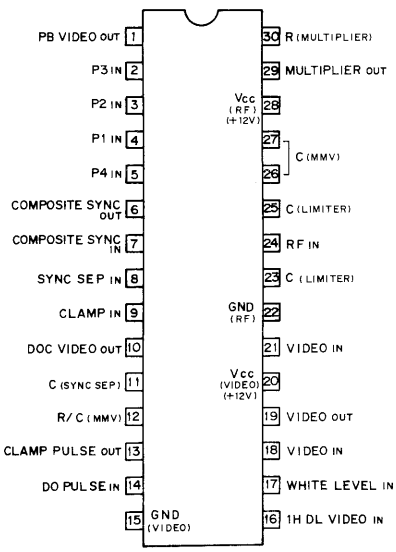


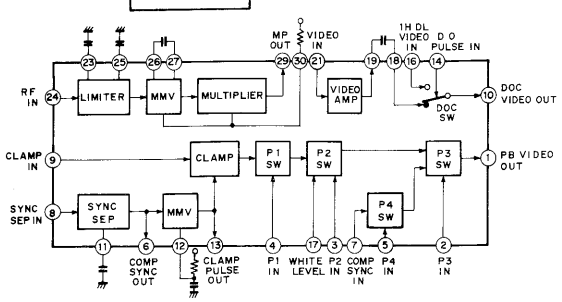


LM311P (TI)
VOLTAGE COMPARATOR WITH STROBE
— TOP VIEW —

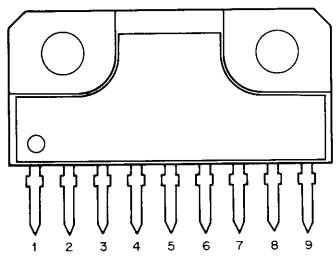


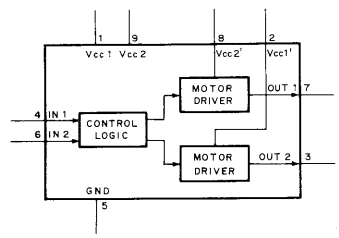
M51480P (MITSUBISHI)
FM DEMODULATOR/VIDEO SIGNAL PROCESSOR
— TOP VIEW —





M54543L (MITSUBISHI)
BI-DIRECTIONAL MOTOR DRIVER
— SIDE VIEW —

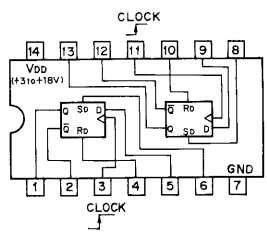




IN		OUT		MODE
1	2	1	2	
0	0	Z	Z	NO OPERATION
1	0	1	0	ROTATION
0	1	0	1	REVERSE ROTATION
1	1	0	0	BRAKE

0 : LOW LEVEL
1 : HIGH LEVEL
Z : HIGH IMPEDANCE

MB84013B (FUJITSU)
C-MOS D-TYPE FLIP-FLOP WITH DIRECT SET/RESET
— TOP VIEW —



DIRECT R-S FLIP FLOP

Sd	Rd	Q	Q̄
0	0	Qn	Q̄n
0	1	0	1
1	0	1	0
1	1	1	1

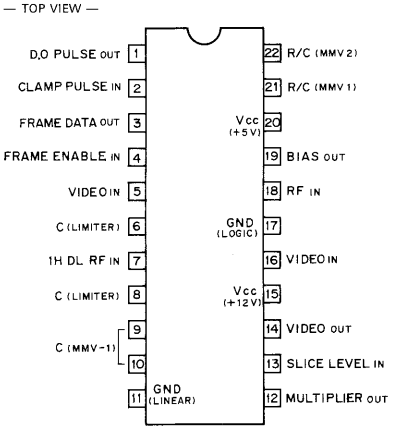
0 ; LOW LEVEL
1 ; HIGH LEVEL

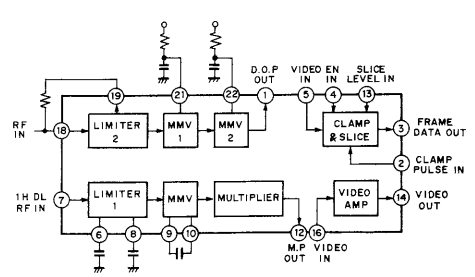
D-TYPE FLIP FLOP

CKn	CKn+1
D	Q
0	0
1	1

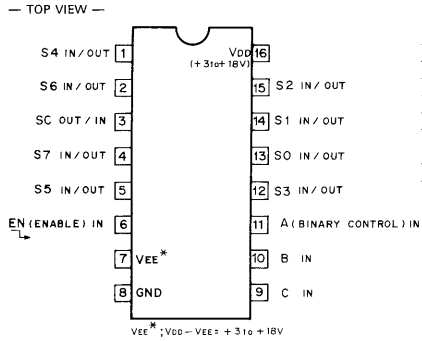
CLOCK CK
CKn ; BEFORE CLOCK
CKn+1 ; AFTER CLOCK

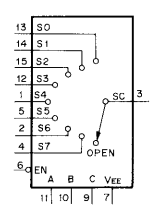
M51481P (MITSUBISHI)
DROPOUT DETECTOR/FRAME DATA SEPARATOR
— TOP VIEW —





MB84051B (FUJITSU)
TC4051BP (TOSHIBA)
uPD4051BC (NEC)
C-MOS 8-CHANNEL MULTIPLEXER/DEMULTIPLEXER
— TOP VIEW —

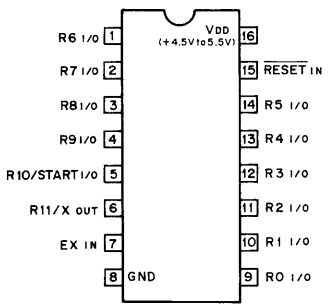

S4 IN / OUT 1
S6 IN / OUT 2
SC OUT / IN 3
S7 IN / OUT 4
S5 IN / OUT 5
EN (ENABLE) IN 6
7 VEE*
8 GND
VDD 16 (+3 to +18V)
15 S2 IN / OUT
14 S1 IN / OUT
13 SO IN / OUT
12 S3 IN / OUT
11 A (BINARY CONTROL) IN
10 B IN
9 C IN
VEE* ; VDD − VEE = +3 to +18V

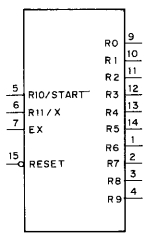


EN	C	B	A	"ON" CHANNEL
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	X	X	X	OPEN

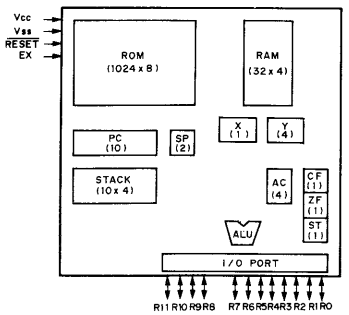
0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

MB88201-173N (FUJITSU)
C-MOS 4 BIT MICROCOMPUTER
— TOP VIEW —

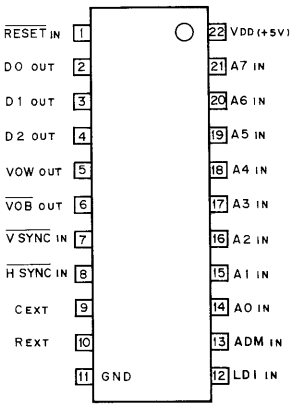


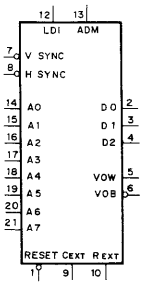


EX ; EXTERNAL X'TAL IN
RO-R11 ; I/O PORT(R) IN/OUT
$\overline{\text{RESET}}$; RESET IN
START ; STANDBY RELEASE IN
R11/X ; EXT CLOCK IN/INT CLOCK OUT

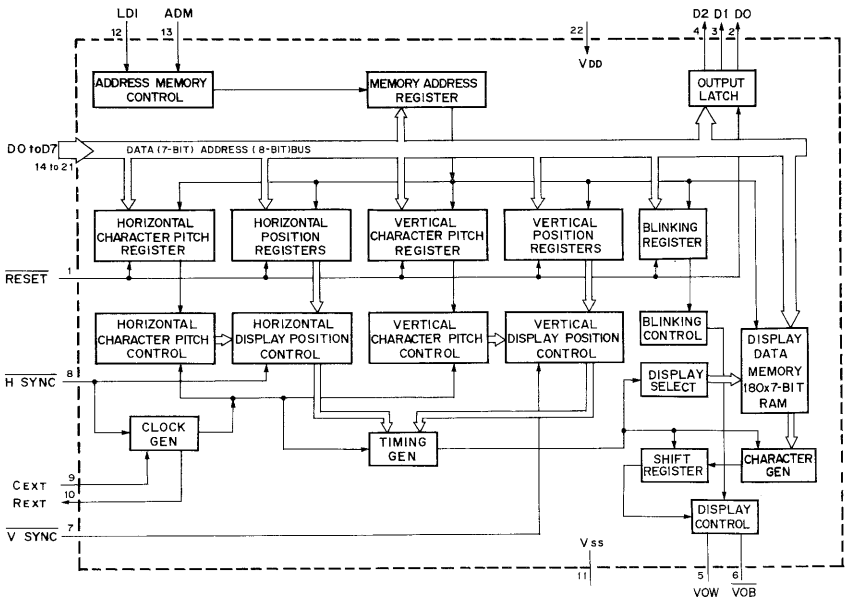


MB88303 (FUJITSU)
N-MOS PROGRAMMABLE TV DISPLAY CONTROLLER
— TOP VIEW —



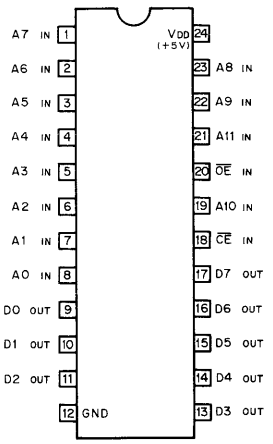


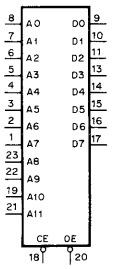
ADM ; ADDRESS INCREMENT MODE
AO to A7 ; ADDRESS INPUT
DO to D2 ; DATA OUTPUT
CEXT ; EXT CAPACITOR FOR OSC
LDI ; LOAD DATA AND INSTRUCTION
VOB ; VIDEO BLACK OUT
VOW ; VIDEO WHITE OUT
REXT ; EXT RESISTOR FOR OSC



b3-b0 / b5-b4	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
00	A	B	C	D	E	F	G	H	I	J	K	L	M	·	␣	BLANK
01	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	:	■	(
10	0	1	2	3	4	5	6	7	8	9	?	!	'	.	BACK	)
11	↑	↓	←	→	+	−	*	/	=	&						

HN482732AG-30 (HITACHI) (ACCESS TIME = 300 nS)
MBM2732A-30Z (FUJITSU) (ACCESS TIME = 300 nS)
MBM2732A-35Z (FUJITSU) (ACCESS TIME = 350 nS)
N-MOS 32K (4Kx8) UV EPROM
— TOP VIEW —

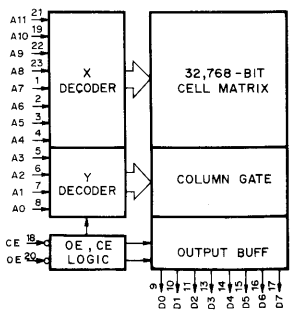




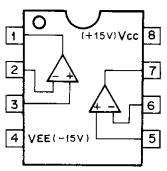
IN		OUT	FUNCTION
CE	OE	Dn	
0	0	DENTERED	READ
1	X	HIGH Z	STANDBY

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE
HIGH Z; HIGH IMPEDANCE

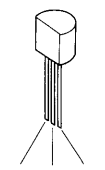
A0-A11 ; ADDRESS
CE ; CHIP ENABLE
OE ; OUTPUT ENABLE
DO-D7 ; DATA OUTPUTS



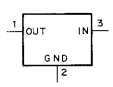
NJM4558D-D (JRC)
uPC4558C (NEC)
OPERATIONAL AMPLIFIER
— TOP VIEW —



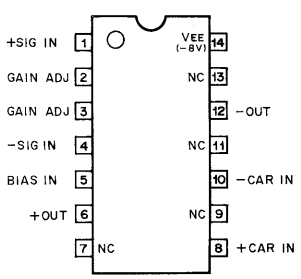
NJM78L??A (JRC)
POSITIVE VOLTAGE REGULATOR (40mA)

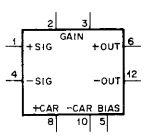


2V	NJM78L02A
3V	NJM78L03A
5V	NJM78L05A
6V	NJM78L06A
8V	NJM78L08A
9V	NJM78L09A
12V	NJM78L12A
15V	NJM78L15A

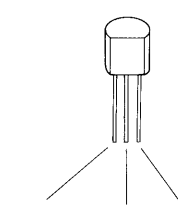


MC1496P (MOTOROLA)
BALANCED MODULATOR/DEMODULATOR
— TOP VIEW —

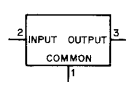




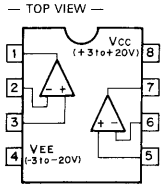
NJM79L??A (JRC)
NEGATIVE VOLTAGE REGULATOR (100mA)
— FRONT VIEW —



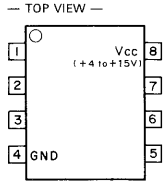
OUTPUT VOLTAGE	??
-3V	03
-5V	05
-6V	06
-8V	08
-9V	09
-12V	12
-15V	15
-18V	18
-24V	24

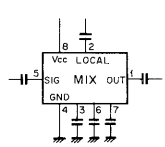


NE5532P (TI)
LOW NOISE OPERATIONAL AMPLIFIER
— TOP VIEW —

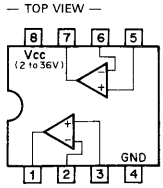


SN16913P (TI)
BALANCED MIXER
— TOP VIEW —

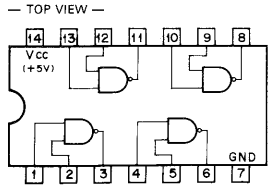


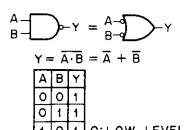


NJM2903D (JRC)
VOLTAGE COMPARATOR
— TOP VIEW —



SN74LS00N (TI)
TTL 2-INPUT POSITIVE-NAND GATE
— TOP VIEW —

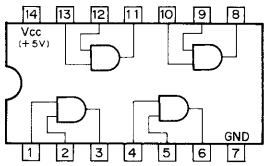


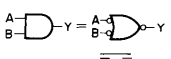


A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

0; LOW LEVEL
1; HIGH LEVEL

SN74LS08N (TI)
TTL 2-INPUT POSITIVE-AND GATE
— TOP VIEW —

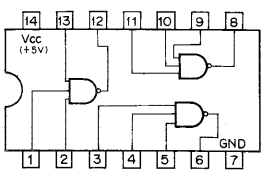


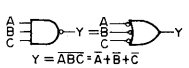


A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

0; LOW LEVEL
1; HIGH LEVEL

SN74LS10N (TI)
TTL 3-INPUT POSITIVE NAND GATE
— TOP VIEW —

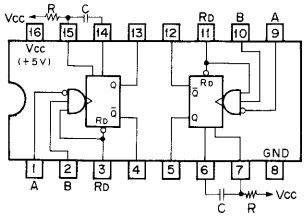




A	B	C	Y
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	0

0 : LOW LEVEL
1 : HIGH LEVEL

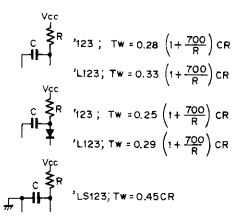
SN74LS123N (TI)
TTL RETRIGGERABLE MONOSTABLE MULTIVIBRATOR WITH DIRECT RESET
— TOP VIEW —



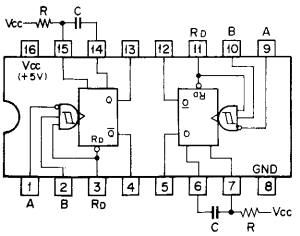
INPUTS			OUTPUTS	
R_D	A	B	Q	$\bar{Q}$
0	X	X	0	1
X	1	X	0	1
X	X	0	0	1
1	0	↑	⎍	⎍
1	↓	1	⎍	⎍
↑	0	1	⎍	⎍

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

OUTPUT PULSE WIDTH



SN74LS221N (TI)
TTL MONOSTABLE MULTIVIBRATOR WITH SCHMITT TRIGGER INPUT
— TOP VIEW —

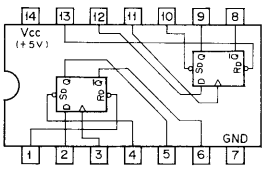


INPUTS			OUTPUTS	
R_D	A	B	Q	$\bar{Q}$
0	X	X	0	1
X	1	X	0	1
X	X	0	0	1
1	0	↑	⎍	⎍
1	↓	1	⎍	⎍
↑	0	1	⎍	⎍

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

OUTPUT PULSE WIDTH = 0.7CR

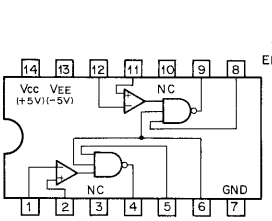
SN74S74N (TI)
SN74LS74AN (TI)
TTL D-TYPE FLIP FLOP WITH DIRECT SET/RESET
— TOP VIEW —

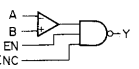


INPUTS				OUTPUTS	
$\bar{S}_D$	$\bar{R}_D$	CK	D	Qn+1	$\overline{Qn+1}$
0	1	X	X	1	0
1	0	X	X	0	1
0	0	X	X	1*	1*
1	1	↑	1	1	0
1	1	↑	0	0	1
1	1	0	X	Qn	$\bar{Q}n$

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE
1*; NONSTABLE

SN75107AN (TI)
LINE RECEIVER
— TOP VIEW —

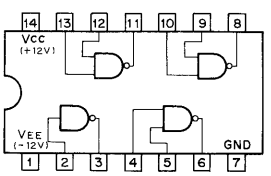


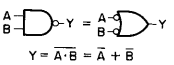


DIFF. INPUTS	EN	ENC	Y
B-A ≦ −25mV	X	X	1
|B−A| < 25mV	X	0	1
	0	X	1
	1	1	N·D
B−A ≧ 25mV	X	0	1
	0	X	1
	1	1	0

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE
ND; NOT DEFINED

SN75188N (TI)
2-INPUT (1-INPUT) POSITIVE-NAND LINE DRIVER
— TOP VIEW —

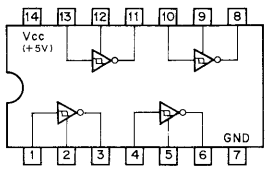




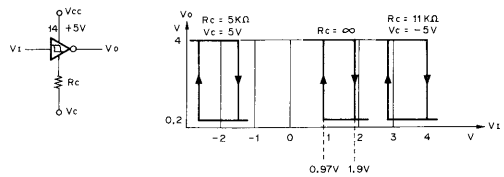
A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

0; LOW LEVEL
1; HIGH LEVEL

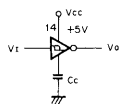
SN75189AN (TI)
QUADRUPLE LINE RECEIVER
— TOP VIEW —



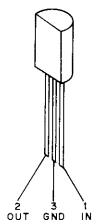
INPUT THRESHOLD SHIFTING

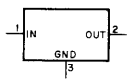


INPUT NOISE FILTERING



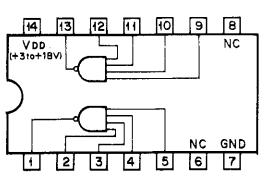
TA78L ? ? ?AP (TOSHIBA)
VOLTAGE REGULATOR

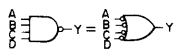




+5V	TA78L005AP
+6V	TA78L006AP
+7V	TA78L007AP
+7.5V	TA78L075AP
+8V	TA78L008AP
+9V	TA78L009AP
+10V	TA78L010AP
+12V	TA78L012AP
+13.2V	TA78L132AP
+15V	TA78L015AP
+18V	TA78L018AP
+20V	TA78L020AP
+24V	TA78L024AP

TC4012BP (TOSHIBA)
C-MOS 4-INPUT NAND GATE
— TOP VIEW —



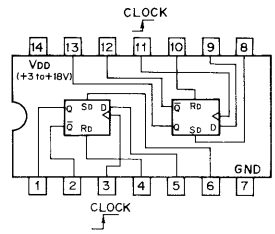


$Y = \overline{A \cdot B \cdot C \cdot D}$
$= \overline{A} + \overline{B} + \overline{C} + \overline{D}$

A	B	C	D	Y
X	X	X	0	1
X	X	0	X	1
X	0	X	X	1
0	X	X	X	1
1	1	1	1	0

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

TC4013BP (TOSHIBA)
TC504013BP (TOSHIBA)
C-MOS D-TYPE FLIP FLOP WITH DIRECT SET/RESET
— TOP VIEW —



DIRECT R-S FLIP FLOP

Sd	Rd	Q	$\overline{Q}$
0	0	On	$\overline{On}$
0	1	0	1
1	0	1	0
1	1	0	1

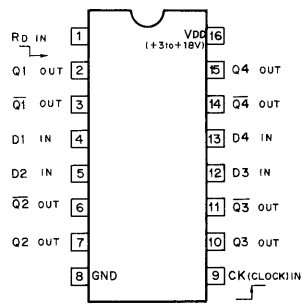
D-TYPE FLIP FLOP

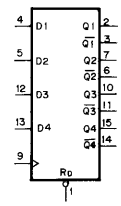
CKn	CKn+1
D	Q
0	0
1	1

CLOCK CK; ⌐ ⌐
CKn; BEFORE CLOCK
CKn+1; AFTER CLOCK

0; LOW LEVEL
1; HIGH LEVEL

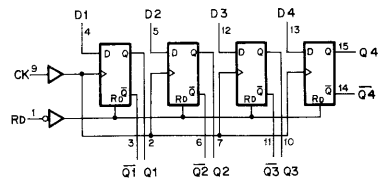
TC40175BP (TOSHIBA)
C-MOS D-TYPE FLIP-FLOP
— TOP VIEW —



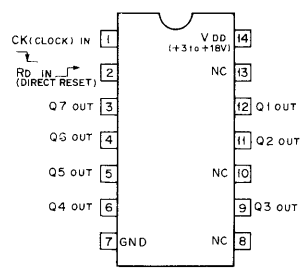


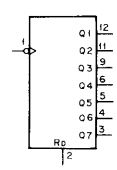
CK	D	RD	Q	$\overline{Q}$
⌐	0	1	0	1
⌐	1	1	1	0
⌊	X	1	Q0	$\overline{Q0}$
X	X	0	0	1

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE



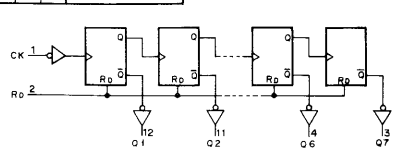
TC4024BP (TOSHIBA)
μPD4024BC (NEC)
C-MOS ASYNCHRONOUS 7-BIT BINARY COUNTER
— TOP VIEW —



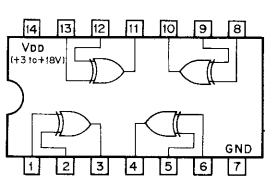


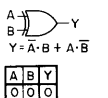
COUNT	INPUTS		OUTPUTS						
	CK	RD	Q7	Q6	Q5	Q4	Q3	Q2	Q1
0	X	1	0	0	0	0	0	0	0
1	⌐	0	0	0	0	0	0	0	1
2	⌐	0	0	0	0	0	0	1	0
3	⌐	0	0	0	0	0	0	1	1
4	⌐	0	0	0	0	0	1	0	0
125	⌐	0	1	1	1	1	1	0	1
126	⌐	0	1	1	1	1	1	1	0
127	⌐	0	1	1	1	1	1	1	1
—	0	0	NO CHANGE						
—	1	0							

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE



TC4030BP (TOSHIBA)
uPD4030BC (NEC)
C-MOS EXCLUSIVE OR GATE
— TOP VIEW —

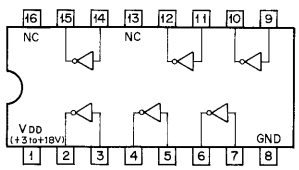


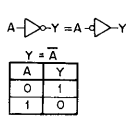


A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

0: LOW LEVEL
1: HIGH LEVEL

TC4049BP (TOSHIBA)
uPD4049UBC (NEC)
C-MOS INVERTING TYPE BUFFER/CONVERTER
— TOP VIEW —

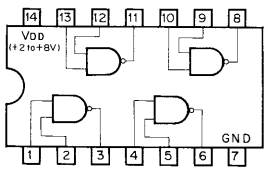


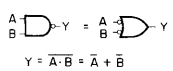


A	Y
0	1
1	0

0; LOW LEVEL
1; HIGH LEVEL

TC40H000P (TOSHIBA)
C-MOS 2-INPUT NAND GATE
— TOP VIEW —

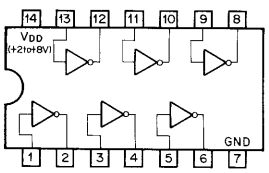




A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

0; LOW LEVEL
1; HIGH LEVEL

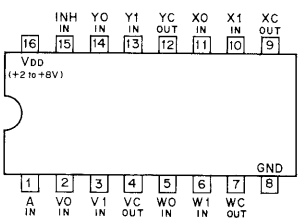
TC40H004P (TOSHIBA)
C-MOS INVERTER
— TOP VIEW —

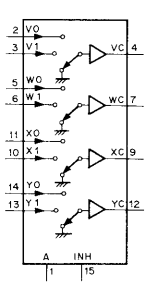


A	Y
0	1
1	0

0; LOW LEVEL
1; HIGH LEVEL

TC40H157P (TOSHIBA)
C-MOS 2-LINE-TO-1-LINE DATA SELECTOR/MULTIPLEXER
— TOP VIEW —

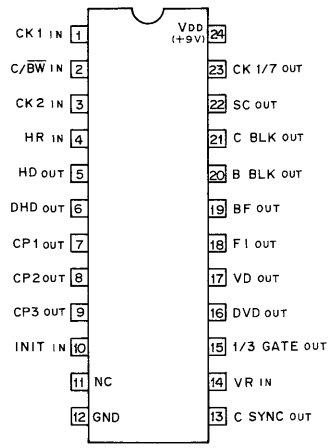


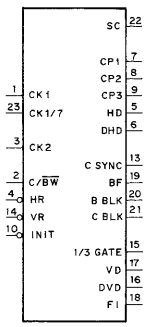


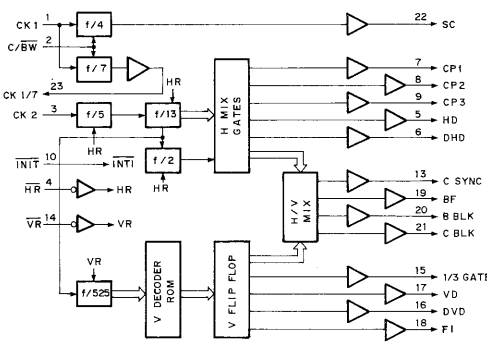
CONT. IN		ON CHANNEL
INH	A	
0	0	0
0	1	1
1	X	GND

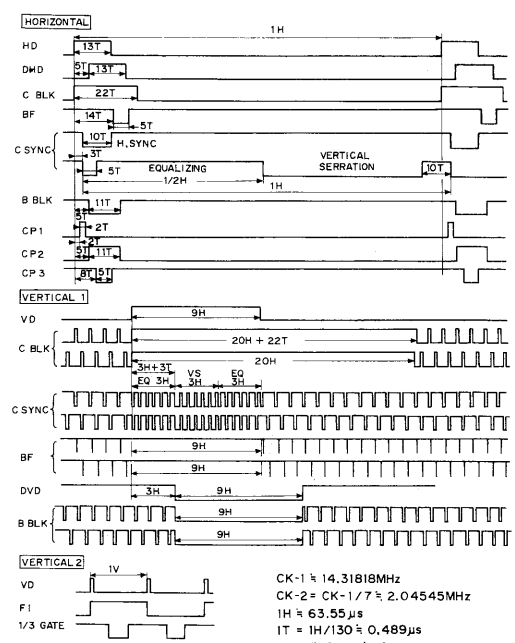
0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

TC5003P (TOSHIBA)
C-MOS 525/60 TV SYNC GENERATOR
— TOP VIEW —





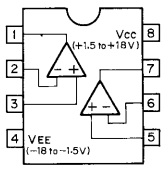




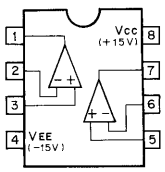
CK-1 ≒ 14.31818MHz
CK-2 = CK-1/7 ≒ 2.04545MHz
1H ≒ 63.55μs
1T = 1H/130 ≒ 0.489μs
1V = 525H/2 ≒ 16.6ms

B BLK ; BEAM BLANKING OUT
BF ; BURST FLAG OUT
C BLK ; COMPOSITE BLANKING OUT
C/BW ; COLOR OR BW MODE SELECT IN
CK1 ; 14MHz CLOCK IN
CK1/7 ; CK1 DIVIDER OUT (2MHz)
CK2 ; 2MHz CLOCK IN
CP1 to 3 ; CLAMP PULSE OUT
C SYNC ; COMPOSITE SYNC OUT
D HD ; DELAYED HD OUT
D VD ; DELAYED VD OUT
FI ; FIELD INDEX OUT
HD ; HORIZONTAL DRIVE OUT
HR ; HORIZONTAL RESET IN
INIT ; INITIALIZE IN (POWER ON)
SC ; SUBCARRIER OUT (3.58MHz)
VD ; VERTICAL DRIVE OUT
VR ; VERTICAL RESET IN
1/3 GATE ; 1/3 FIELD GATE PULSE OUT

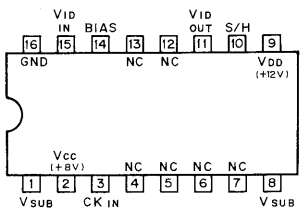
TL062CP (TI)
OPERATIONAL AMPLIFIER
(JFET INPUT)
— TOP VIEW —

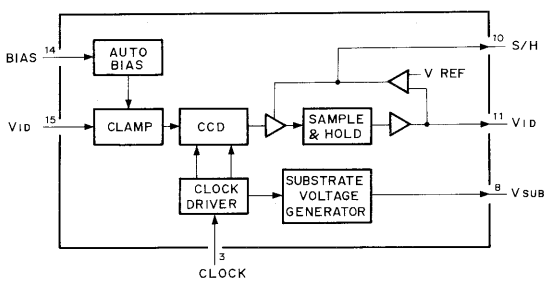


TL082CP (TI)
uPC4082C (NEC)
OPERATIONAL AMPLIFIER
(J FET-INPUT)
— TOP VIEW —

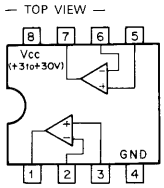


TL8608P (TOSHIBA)
N-CH CCD ANALOG PROCESSING UNIT
— TOP VIEW —

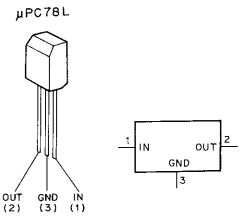




uPC358C (NEC)
DUAL OPERATIONAL AMPLIFIERS
— TOP VIEW —

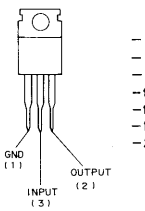


uPC78L ? ?A (NEC)
POSITIVE VOLTAGE REGULATOR (100mA)

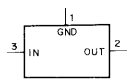


5V	μPC78L05(A)
8V	μPC78L08
12V	μPC78L12
15V	μPC78L15

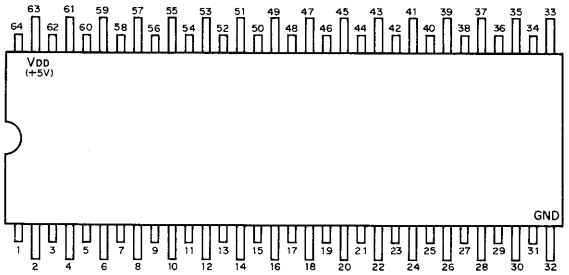
uPC79 ? ?H (NEC)
NEGATIVE VOLTAGE REGULATOR (1A)



− 5V	μPC7905H
− 6V	
− 8V	μPC7908H
−12V	μPC7912H
−15V	μPC7915H
−18V	μPC7918H
−24V	μPC7924H

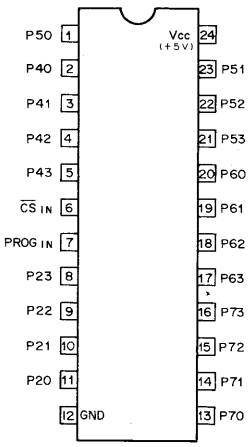


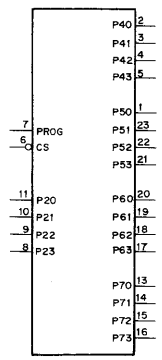
uPD1519AG (NEC)
N-MOS HARDWARE SIMULATOR
— TOP VIEW —



PIN NO.	IN	OUT	SYMBOL	PIN NO.	IN	OUT	SYMBOL	PIN NO.	IN	OUT	SYMBOL	PIN NO.	IN	OUT	SYMBOL
1		○	PE0	17		○	$\overline{PLA}$	33	○	○	PC0	49		○	P4
2		○	PE1	18	○		$\overline{INT}$	34	○	○	PC1	50		○	P3
3		○	PE2	19	○		PA0	35	○	○	PC2	51		○	P2
4		○	PE3	20	○		PA1	36	○	○	PC3	52		○	P1
5		○	PF0	21	○		PA2	37	○	○	PD0	53		○	P0
6		○	PF1	22	○		PA3	38	○	○	PD1	54	○		PSEL
7		○	PF2	23	○		SI	39	○	○	PD2	55	○		$\overline{BREAK}$
8		○	PF3	24		○	SO	40	○	○	PD3	56	○		I7
9		○	PG0	25	○	○	$\overline{SCK}$	41	○		$\overline{RES}$	57	○		I6
10		○	PG1	26	○	○	PB0	42		○	P11	58	○		I5
11		○	PG2	27	○	○	PB1	43		○	P10	59	○		I4
12		○	PG3	28	○	○	PB2	44		○	P9	60	○		I3
13		○	PH0	29	○	○	PB3/CT	45		○	P8	61	○		I2
14		○	PH1	30			X2	46		○	P7	62	○		I1
15		○	PH2	31			X1	47		○	P6	63			VDD
16		○	PH3	32			GND	48		○	P5	64	○		I0

uPD8243C (NEC)
N-MOS I/O PORT EXPANDER
— TOP VIEW —

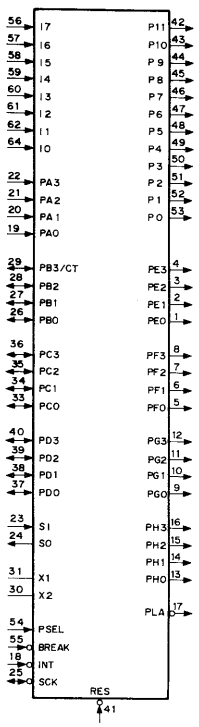




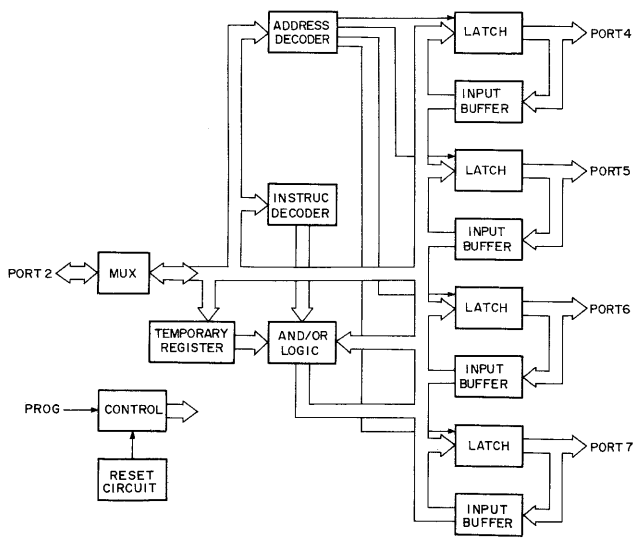
CONTROL AND PORT ADDRESSING

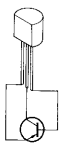
P23	P22	P21	P20	PORT	CONTROL
0	0	0	0	4	READ
0	0	0	1	5	
0	0	1	0	6	
0	0	1	1	7	
0	1	0	0	4	WRITE
0	1	0	1	5	
0	1	1	0	6	
0	1	1	1	7	
1	0	0	0	4	OR
1	0	0	1	5	
1	0	1	0	6	
1	0	1	1	7	
1	1	0	0	4	AND
1	1	0	1	5	
1	1	1	0	6	
1	1	1	1	7	

PROG ; PROGRAM PULSE INPUT
$\overline{CS}$; CHIP SELECT INPUT
P20~P23 ; I/O PORT 2 (FOR CPU)
P40~P43 ; I/O PORT 4
P50~P53 ; I/O PORT 5
P60~P63 ; I/O PORT 6
P70~P73 ; I/O PORT 7

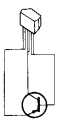


BREAK ; CPU BREAK, PROGRAM STEP CONTROL IN
I7 to I0 ; INSTRUCTION IN
INT ; EXT INTERRUPT REQUEST IN
PA3 to PA0 ; PORT A (I)
PB3/CT to PB0 ; PORT B (I/O), CT; EVENT COUNTER IN
PC3 to PC0 ; PORT C (I/O)
PD3 to PD0 ; PORT D (I/O)
PE3 to PE0 ; PORT E (O)
PF3 to PF0 ; PORT F (O)
PG3 to PG0 ; PORT G (O)
PH3 to PH0 ; PORT H (O)
PLA ; EXT PLA SELECT OUT
PSEL ; P11 to P0 OUTPUT SELECT IN
RES ; RESET IN
SCK ; SERIAL CLOCK IN/OUT
SI ; SERIAL DATA IN
SO ; SERIAL DATA OUT
X1, X2 ; Xtal CONNECTION FOR INT CLOCK
X1; EXT CLOCK IN

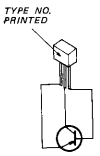




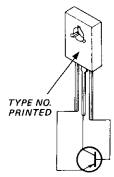
2SA1005
2SA564
2SA844



2SA1048
2SA1115
2SA933S

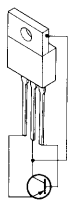


2SA1175



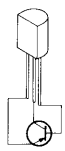
2SA1184

2SA1206

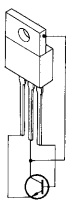


2SB553
2SB825

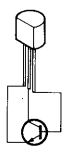
2SB734



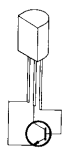
2SB740



2SC1061
2SC1826
2SD1061
2SD1135
2SD313HP
2SD553

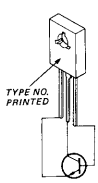


2SC1363
2SC1364
2SC2878
2SC3068
2SC641K

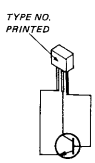


2SC1474
2SC1475
2SD788
2SD789

2SC1740S
2SC2458
2SC2603
2SC403SP



2SC2690A
2SC2824



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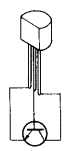

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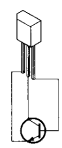
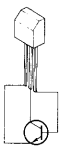
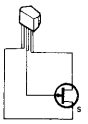


2SC403C

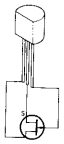
SEMICONDUCTOR ELECTRODES



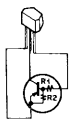
2SD773
2SD774



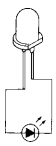
2SK184



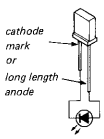
2SK523



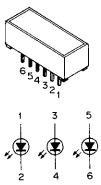
DTA114ES (R1=10K, R2=10K)



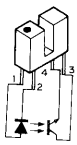
GL-4HD5



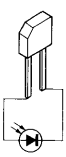
GL-9PR2



LT9010D



ON1110



PH302B

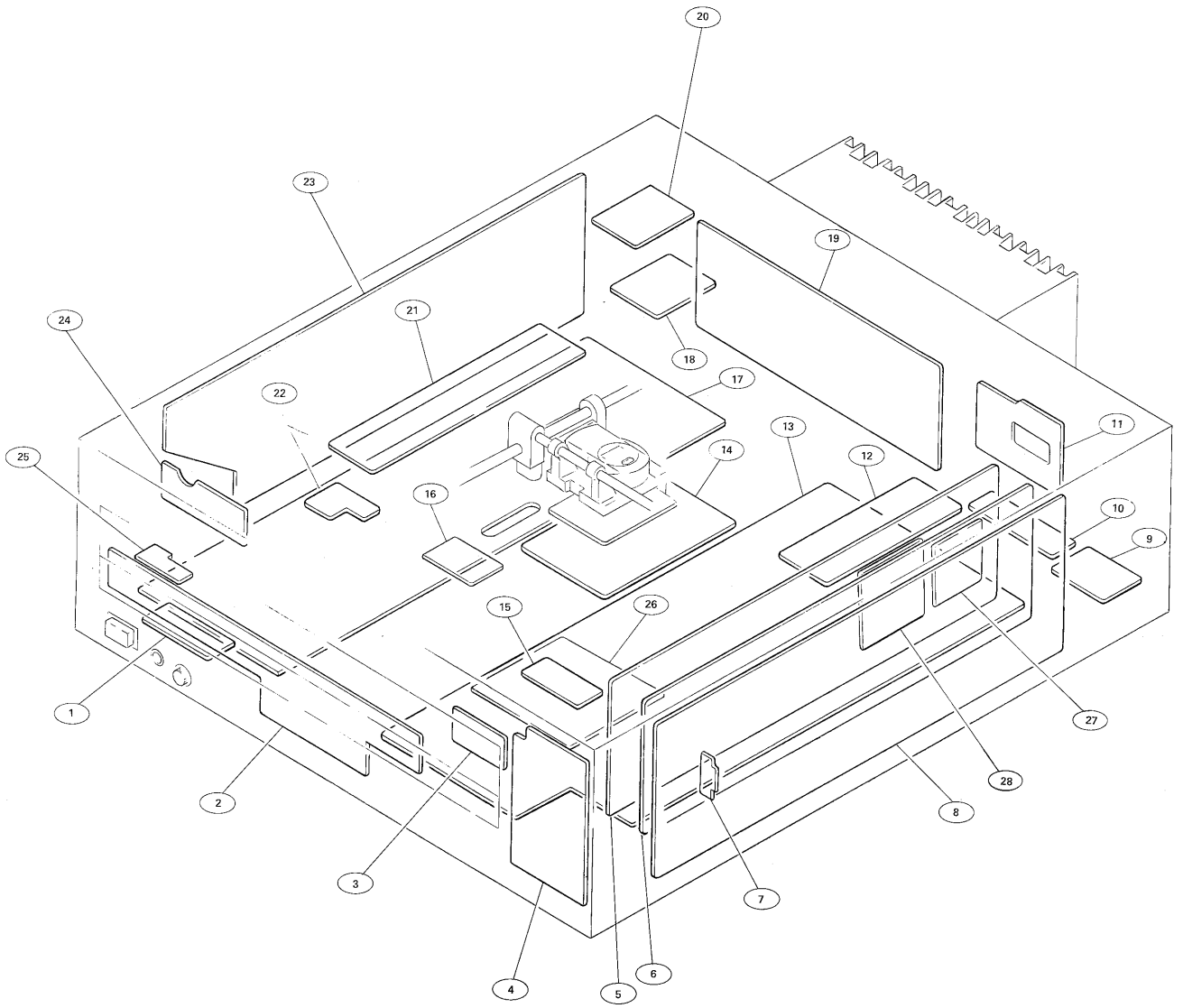
SECTION 7
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

7-1. CIRCUIT FUNCTION

The main circuit boards used in the LDP-2000 are listed below.

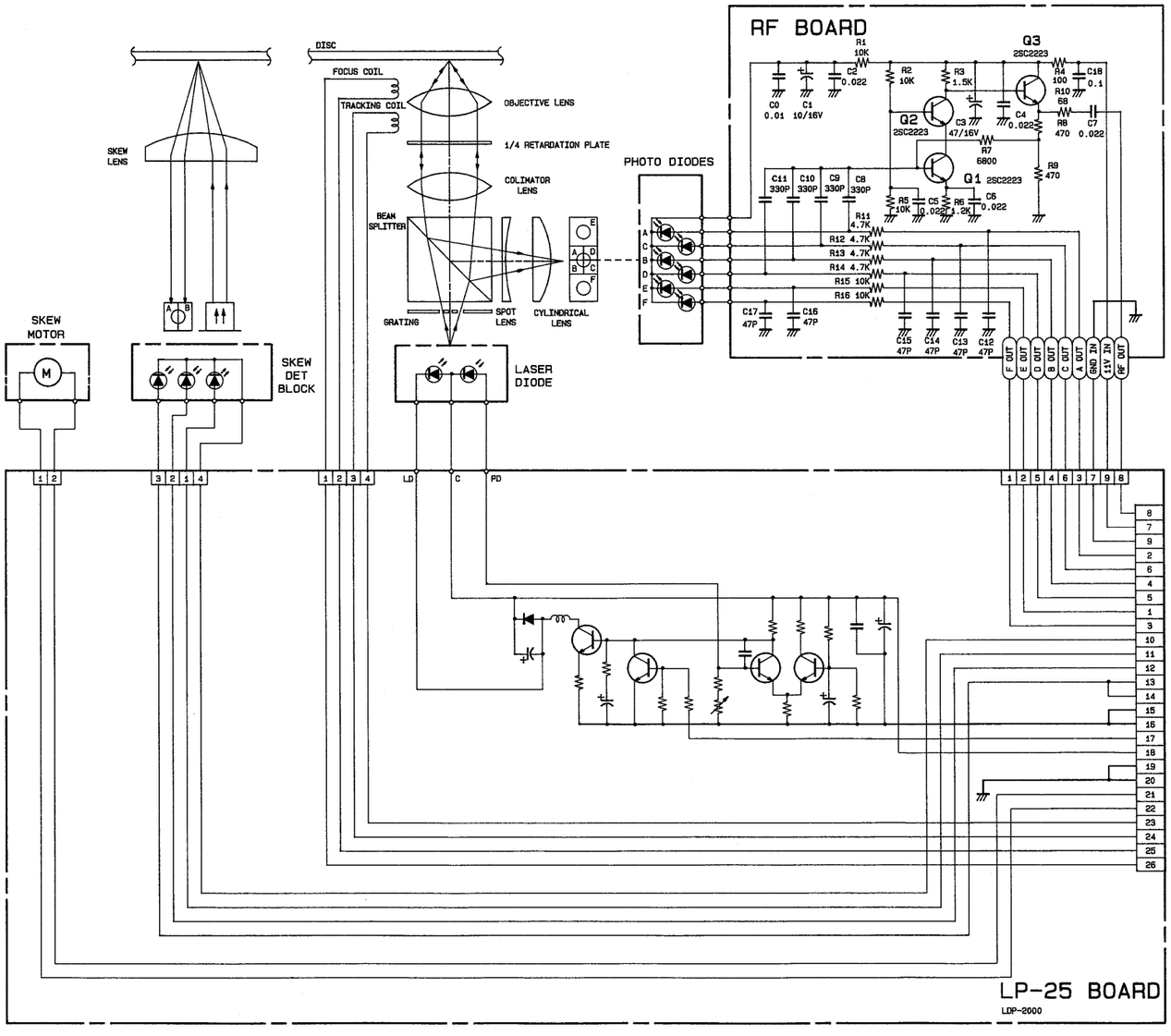
BOARD	CIRCUIT FUNCTION
HP-18	HEADPHONES AMP
LE-23	FRONT PANEL INDICATOR
DU-75	FRONT LOADING
KY-69	KEY SIGNAL ENCODER
SV-65	SPINDLE SERVO
SV-69	TBC SYNC GENERATOR
DL-11 DM-45	VIDEO DEMODULATOR, VIDEO TBC
DU-84	CONNECTOR PANEL
DUS-13	CONNECTOR PANEL
DUS-12	CONNECTOR PANEL
DUS-28	OPTION BOARD CONNECTOR
SY-30	SYSTEM CONTROL
RF-7	RF AMP
DU-74	FRONT LOADING
DU-82	FRONT LOADING
SA-16	AUDIO SYSTEM, SKEW SERVO
SW-87	POWER SWITCH
AC-49	DC POWER DISTRIBUTOR
DUS-29	OPTION BOARD CONNECTOR
DUS-25	SLED BASE
DUS-11	SLED BASE
SV-59	FOCUS/TRACKING SERVO, SLIDE SEROV
DUS-27	SAFETY SWITCH
DUS-23	FRONT LOADING
MC-25	NOISE CANCELLER
SG-102 SG-103	SYNC GENERATOR
RF	RF PRE AMP
UR-12	SWITCHING REGULATOR

7-2. LOCATION OF THE PRINTED CIRCUIT BOARDS

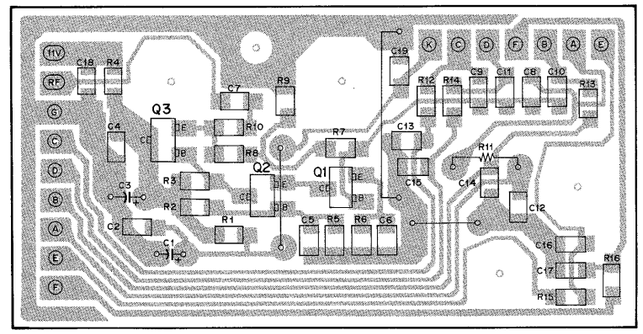


① HP-18 BOARD
② LE-23 BOARD
③ DU-75 BOARD
④ KY-69 BOARD
⑤ SV-65 BOARD
⑥ SV-69 BOARD
⑦ DL-11 BOARD
⑧ DM-45 BOARD
⑨ DU-84 BOARD
⑩ DUS-13 BOARD
⑪ DUS-12 BOARD
⑫ DUS-28 BOARD
⑬ SY-30 BOARD
⑭ RF-7 BOARD
⑮ DU-74 BOARD
⑯ DU-82 BOARD
⑰ SA-16 BOARD
⑱ SW-87 BOARD
⑲ AC-49 BOARD
⑳ DUS-29 BOARD
㉑ DUS-25 BOARD
㉒ DUS-11 BOARD
㉓ SV-59 BOARD
㉔ DUS-27 BOARD
㉕ DUS-23 BOARD
㉖ MC-25 BOARD
㉗ SG-102 BOARD
㉘ SG-103 BOARD

LP-25 (APC)
RF (RF PREAMP)

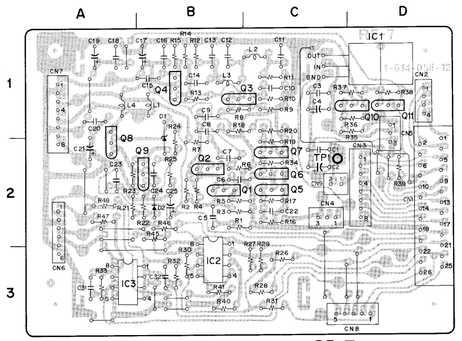


RF (RF PREAMP)



RF-01 –SOLDERING SIDE–
1-614-368-12
LDP-2000

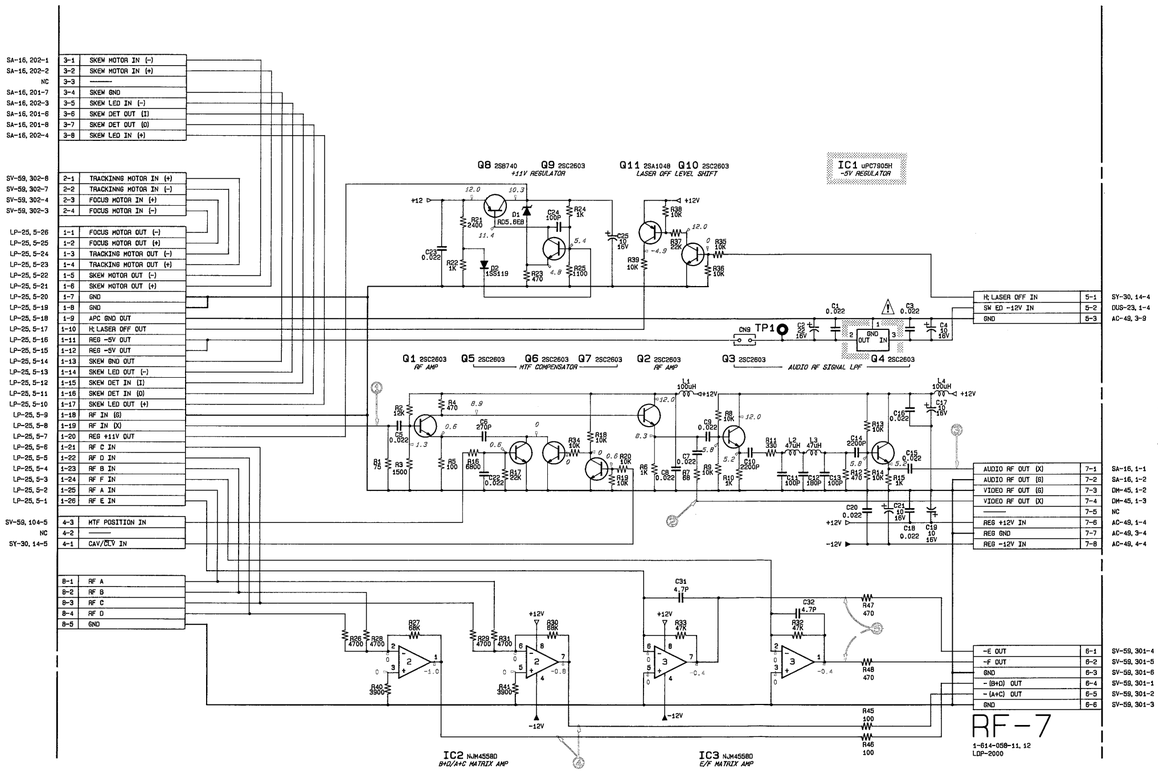
RF-7 (RF AMP)



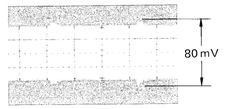
RF-7–SOLDERING SIDE–
1-614-058-12
LDP-2000

CN1	D - 2
CN2	D - 1
CN3	D - 2
CN4	C - 2
CN5	D - 1
CN6	A - 2
CN7	A - 1
CN8	D - 3
CN9	C - 2
D1	B - 2
TP1	B - 2
IC1	D - 1
IC2	B - 3
IC3	A - 3
Q1	B - 2
Q2	B - 2
Q3	B - 1
Q4	B - 1
Q5	C - 2
Q6	C - 2
Q7	C - 2
Q8	A - 2
Q9	B - 2
Q10	D - 1
Q11	D - 1
TP1	C - 2

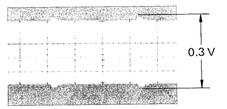
NOTE: **The shaded and ⚠-marked components are critical to safety.**
Replace only with same components as specified.


SA-16, 202-1 3-1 SKEW MOTOR IN (-)
SA-16, 202-2 3-2 SKEW MOTOR IN (+)
NC 3-3 ———
SA-16, 201-7 3-4 SKEW GND
SA-16, 202-3 3-5 SKEW LED IN (-)
SA-16, 201-6 3-6 SKEW DET OUT (I)
SA-16, 201-8 3-7 SKEW DET OUT (G)
SA-16, 202-4 3-8 SKEW LED IN (+)
SV-59, 302-8 2-1 TRACKING MOTOR IN (+)
SV-59, 302-7 2-2 TRACKING MOTOR IN (-)
SV-59, 302-4 2-3 FOCUS MOTOR IN (+)
SV-59, 302-3 2-4 FOCUS MOTOR IN (-)
LP-25, 5-26 1-1 FOCUS MOTOR OUT (-)
LP-25, 5-25 1-2 FOCUS MOTOR OUT (+)
LP-25, 5-24 1-3 TRACKING MOTOR OUT (-)
LP-25, 5-23 1-4 TRACKING MOTOR OUT (+)
LP-25, 5-22 1-5 SKEW MOTOR OUT (-)
LP-25, 5-21 1-6 SKEW MOTOR OUT (+)
LP-25, 5-20 1-7 GND
LP-25, 5-19 1-8 GND
LP-25, 5-18 1-9 APC GND OUT
LP-25, 5-17 1-10 H LASER OFF OUT
LP-25, 5-16 1-11 REG -5V OUT
LP-25, 5-15 1-12 REG -5V OUT
LP-25, 5-14 1-13 SKEW GND OUT
LP-25, 5-13 1-14 SKEW LED OUT (-)
LP-25, 5-12 1-15 SKEW DET IN (I)
LP-25, 5-11 1-16 SKEW DET IN (G)
LP-25, 5-10 1-17 SKEW LED OUT (+)
LP-25, 5-9 1-18 RF IN (G)
LP-25, 5-8 1-19 RF IN (X)
LP-25, 5-7 1-20 REG +11V OUT
LP-25, 5-6 1-21 RF C IN
LP-25, 5-5 1-22 RF D IN
LP-25, 5-4 1-23 RF B IN
LP-25, 5-3 1-24 RF F IN
LP-25, 5-2 1-25 RF A IN
LP-25, 5-1 1-26 RF E IN
SV-59, 104-5 4-3 MTF POSITION IN
NC 4-2 ———
SV-30, 14-5 4-1 CAV/CLV IN
8-1 RF A
8-2 RF B
8-3 RF C
8-4 RF D
8-5 GND
Q8 2SB740 Q9 2SC2603 +11V REGULATOR
Q11 2SA1048 Q10 2SC2603 LASER OFF LEVEL SHIFT
IC1 μPC7905H -5V REGULATOR
Q1 2SC2603 RF AMP
Q5 2SC2603 MTF COMPENSATOR
Q6 2SC2603 Q7 2SC2603
Q2 2SC2603 RF AMP
Q3 2SC2603
AUDIO RF SIGNAL LPF
Q4 2SC2603
H LASER OFF IN 5-1 SY-30, 14-4
SW ED -12V IN 5-2 DUS-23, 1-4
GND 5-3 AC-48, 3-3
AUDIO RF OUT (X) 7-1 SA-16, 1-1
AUDIO RF OUT (G) 7-2 SA-16, 1-2
VIDEO RF OUT (G) 7-3 DM-45, 1-2
VIDEO RF OUT (X) 7-4 DM-45, 1-3
——— 7-5 NC
REG +12V IN 7-6 AC-48, 1-4
REG GND 7-7 AC-48, 3-4
REG -12V IN 7-8 AC-48, 4-4
-E OUT 6-1 SV-59, 301-4
-F OUT 6-2 SV-59, 301-5
GND 6-3 SV-59, 301-6
-(A+C) OUT 6-4 SV-59, 301-1
-(A+C) OUT 6-5 SV-59, 301-2
GND 6-6 SV-59, 301-3
IC2 MM4558D BHD/AHC MATRIX AMP
IC3 MM4558D E/F MATRIX AMP
RF-7
1-614-058-11, 12
LDP-2000

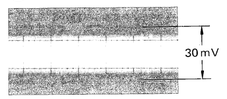
① **1-19**



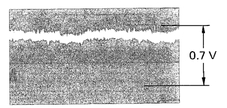
② **7-4**



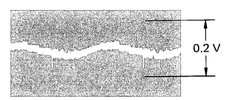
③ **7-1**



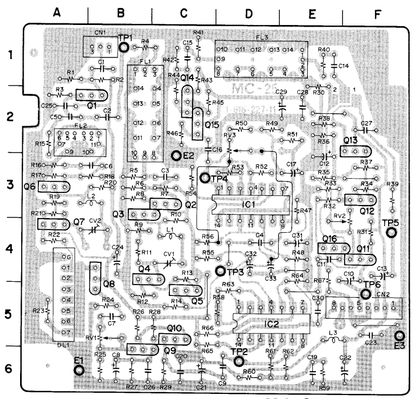
④ **IC 2-1** (STILL MODE)
IC 2-7 (STILL MODE)



⑤ **IC 3-1** (STILL MODE)
IC 3-7 (STILL MODE)

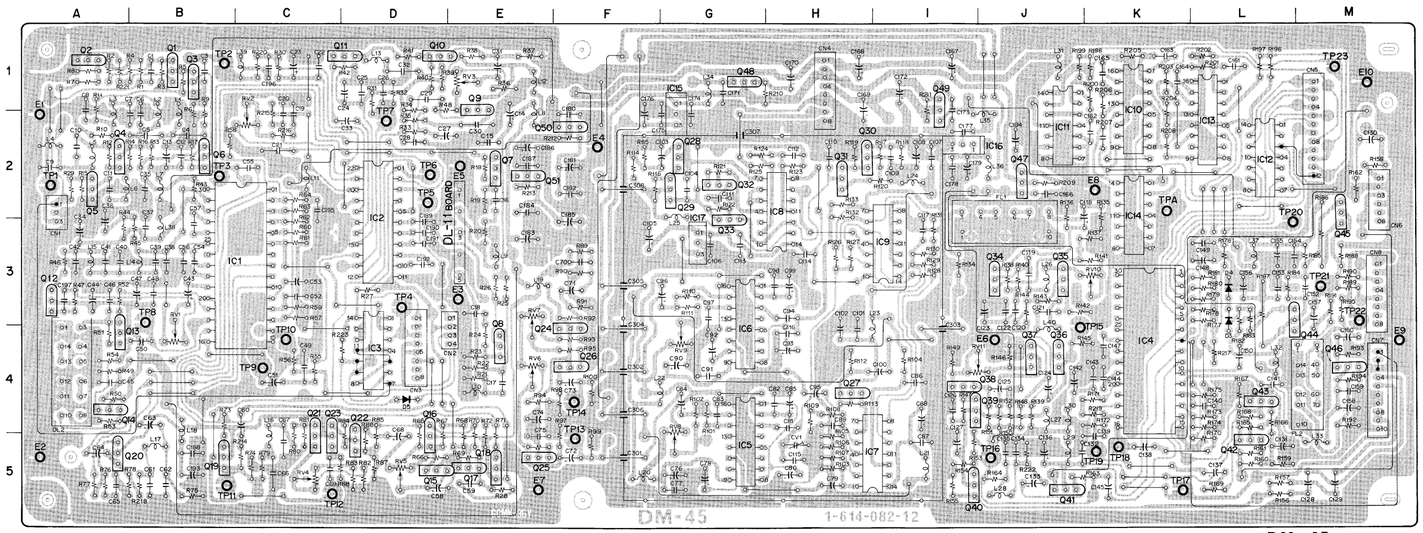


DM-45 (VIDEO DEMODULATOR)
DL-11
MC-25 (NOISE CANCELLER)

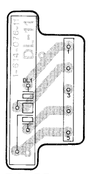


MC-25 -SOLDERING SIDE-
1-616-227-11
LDP-2000

CN1	B - 1
CN2	F - 5
CV1	C - 4
CV2	B - 1
DL1	A - 5
E1	A - 6
E2	C - 3
E3	F - 5
FL1	B - 2
FL2	A - 2
FL3	D - 1
IC1	D - 3
IC2	D - 5
Q1	B - 2
Q2	C - 3
Q3	B - 3
Q4	B - 1
Q5	C - 5
Q6	A - 3
Q7	A - 1
Q8	B - 1
Q9	B - 6
Q10	C - 5
Q11	F - 4
Q12	F - 3
Q13	F - 2
Q14	C - 2
Q15	C - 2
Q16	E - 1
RV1	B - 5
RV2	F - 3
RV3	D - 2
TP1	B - 1
TP2	D - 6
TP3	D - 1
TP4	C - 3
TP5	F - 1
TP6	F - 5



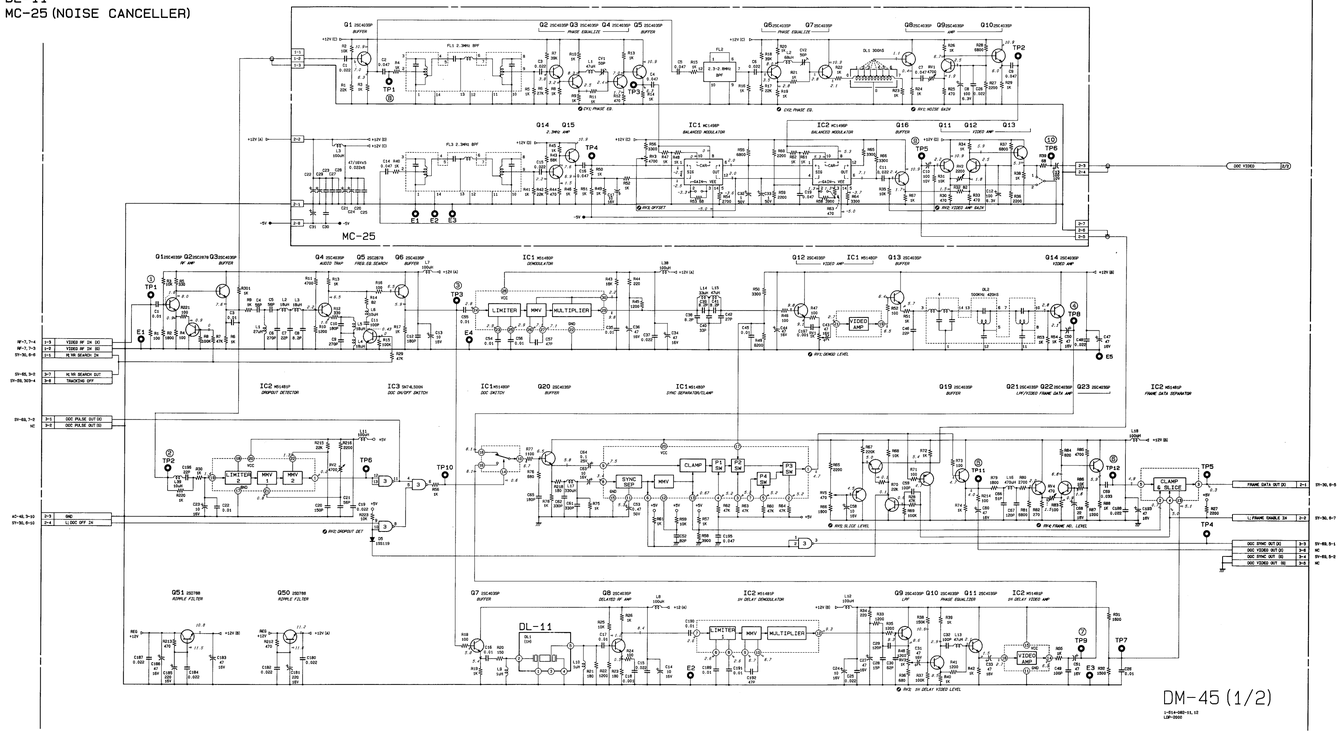
DM-45 -SOLDERING SIDE-
1-614-082-12
LDP-2000



DL-11 -SOLDERING SIDE-
1-614-076-11
LDP-2000

CN1	A - 2
CN2	D - 4
CN3	D - 4
CN4	H - 1
CN5	M - 2
CN6	M - 2
CN7	M - 4
CN8	M - 3
CV1	H - 5
D3	L - 3
D4	L - 3
D5	D - 4
DL1	E - 2
DL2	A - 4
E1	A - 2
E2	A - 5
E3	E - 3
E4	F - 2
E5	E - 2
E6	I - 3
E7	E - 5
E8	K - 2
E9	M - 4
E10	M - 1
FL1	J - 2
FL2	M - 4
IC1	C - 3
IC2	D - 2
IC3	D - 4
IC4	K - 4
IC5	G - 5
IC6	G - 3
IC7	I - 5
IC8	H - 2
IC9	I - 3
IC10	K - 2
IC11	J - 2
IC12	L - 2
IC13	L - 2
IC14	K - 2
IC15	G - 1
IC16	I - 2
IC17	G - 3
Q1	B - 1
Q2	A - 1
Q3	B - 1
Q4	A - 2
Q5	A - 2
Q6	B - 2
Q7	E - 2
Q8	E - 4
Q9	E - 2
Q10	D - 1
Q11	D - 1
Q12	A - 3
Q13	A - 4
Q14	A - 4
Q15	D - 5
Q16	D - 4
Q17	E - 5
Q18	E - 5
Q19	B - 5
Q20	A - 5
Q21	C - 4
Q22	C - 4
Q23	C - 4
Q24	F - 4
Q25	E - 5
Q26	F - 4
Q27	H - 4
Q28	G - 2
Q29	G - 2
Q30	H - 2
Q31	H - 2
Q32	G - 2
Q33	G - 3
Q34	J - 3
Q35	J - 3
Q36	J - 4
Q37	J - 4
Q38	I - 4
Q39	J - 4
Q40	I - 5
Q41	J - 5
Q42	L - 5
Q43	L - 4
Q44	L - 3
Q45	M - 2
Q46	M - 4
Q47	J - 2
Q48	G - 1
Q49	I - 1
Q50	F - 2
Q51	E - 2
RV1	B - 4
RV2	C - 2
RV3	E - 1
RV4	C - 5
RV5	D - 5
RV6	E - 4
RV7	E - 3
RV8	G - 5
RV9	G - 4
RV10	K - 3
RV11	J - 4
TP1	A - 2
TP2	B - 1
TP3	B - 2
TP4	D - 3
TP5	D - 2
TP6	D - 2
TP7	D - 2
TP8	B - 3
TP9	C - 4
TP10	C - 4
TP11	B - 5
TP12	C - 5
TP13	F - 5
TP14	F - 4
TP15	J - 4
TP16	J - 5
TP17	K - 5
TP18	K - 5
TP19	K - 5
TP20	L - 2
TP21	M - 3
TP22	M - 3
TP23	M - 1
TPA	K - 2

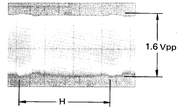
DM-45 (VIDEO DEMODULATOR)
DL-11
MC-25 (NOISE CANCELLER)



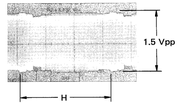
DM-45, DL-11, MC-25 DM-45, DL-11, MC-25

① TP1

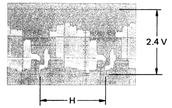
② TP2



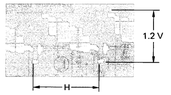
③ TP3



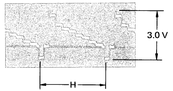
④ TP8



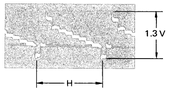
⑤ TP11



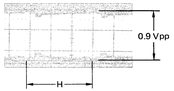
⑥ TP12



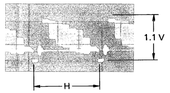
⑦ TP9



⑧ TP1



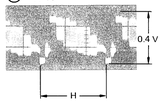
⑨ TP5



⑩ TP6

DM-45 (VIDEO TBC)

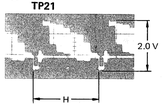
⑪ TP13



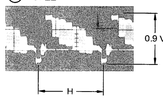
⑫ TP15

⑬ TP16

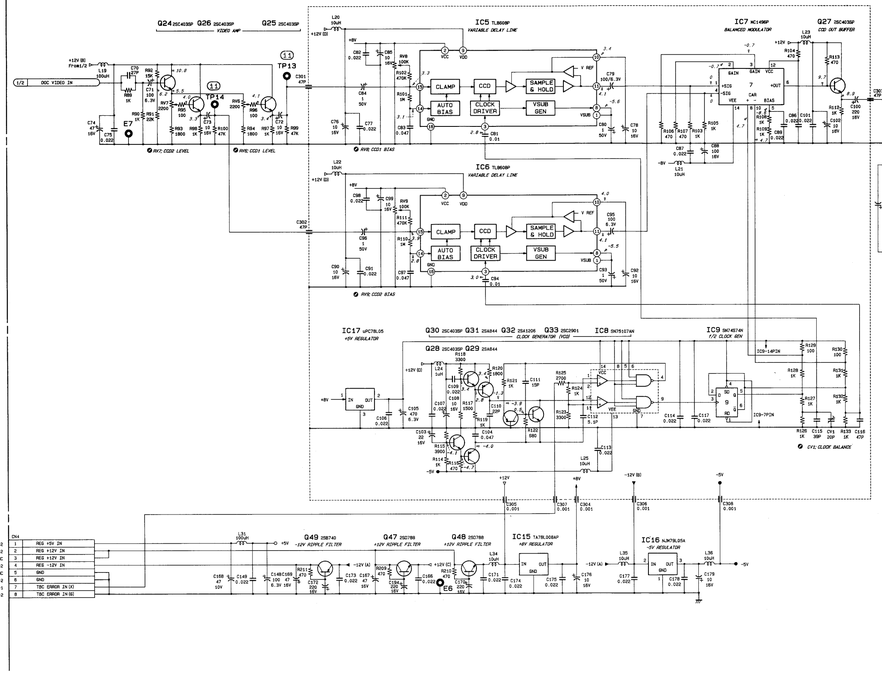
⑭ TP18
TP21



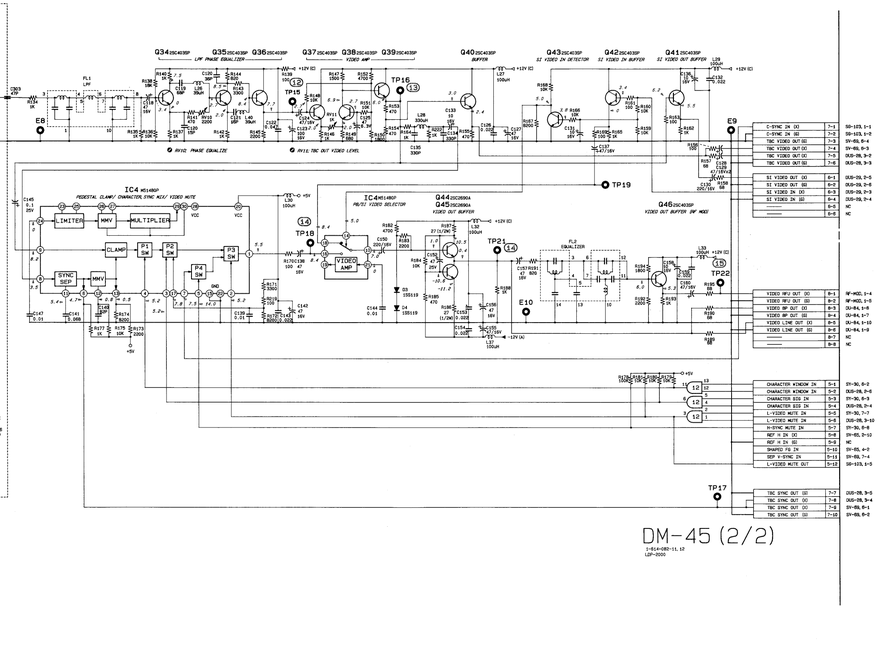
⑮ TP22



DM-45 DM-45

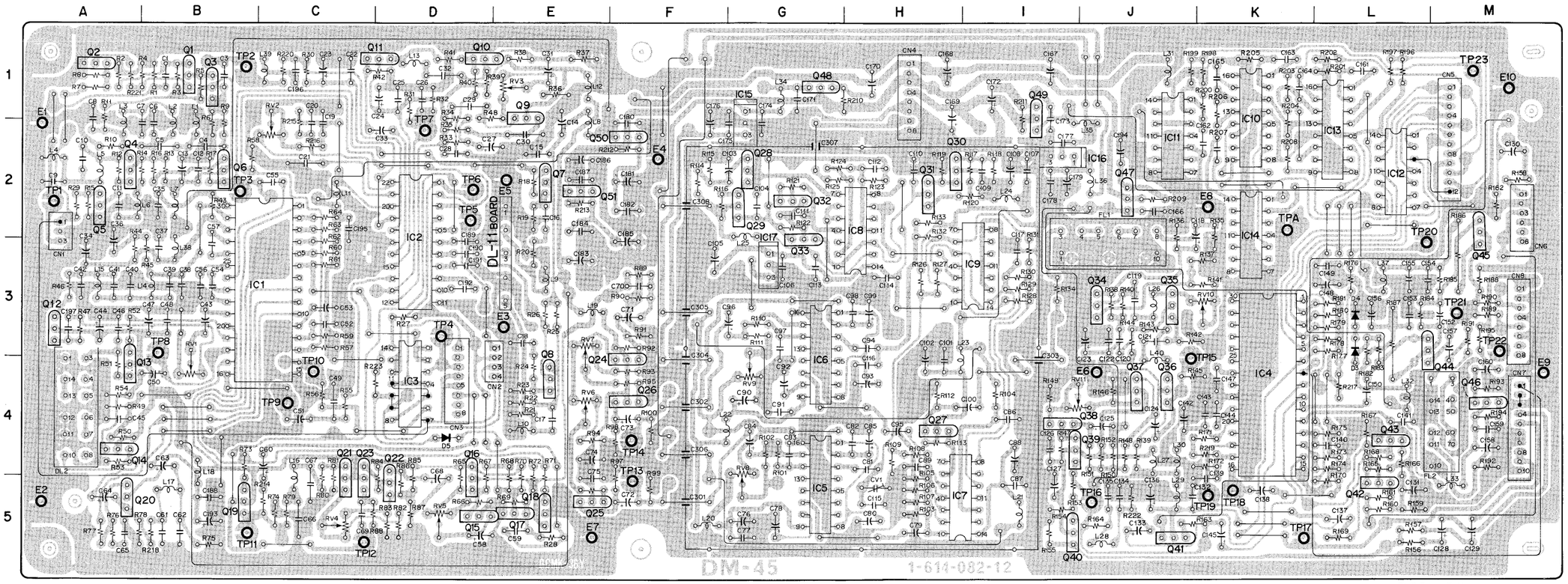


DM-45 DM-45

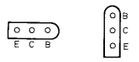


DM-45 (2/2)

DM-45 (VIDEO TBC)

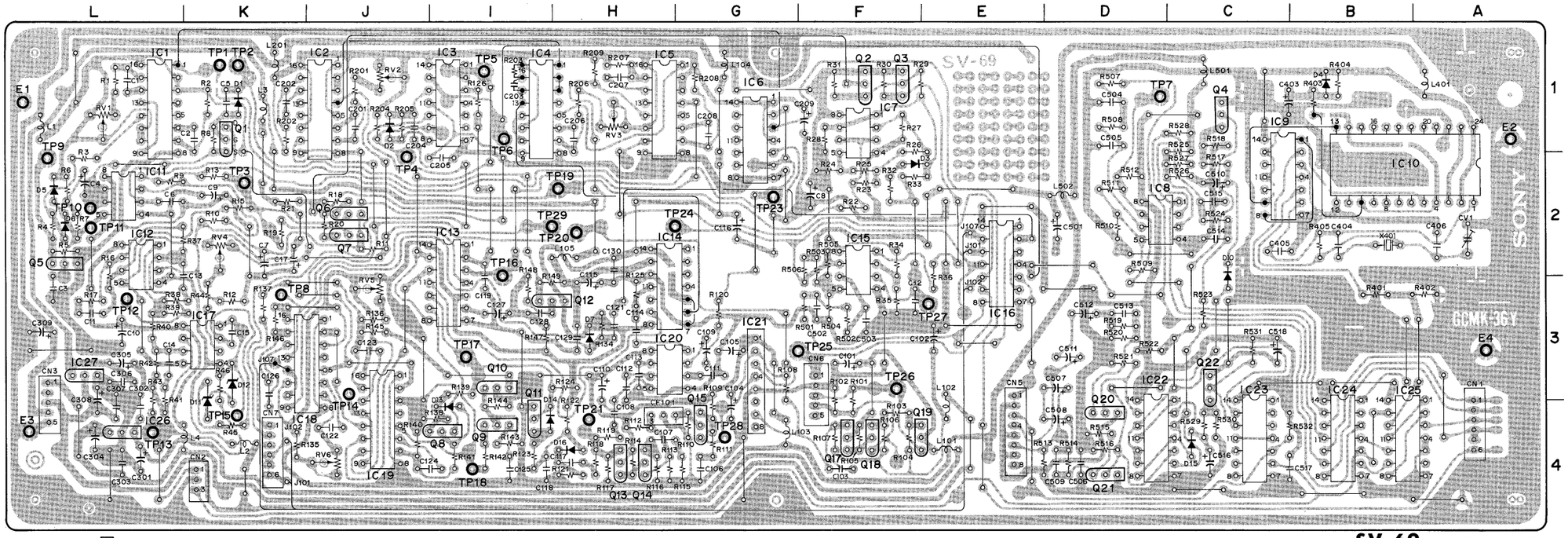


DM-45 –SOLDERING SIDE–
1-614-082-12
LDP-2000



CN1	A - 2	E9	M - 4	Q1	B - 1	Q27	H - 4	RV1	B - 4	TP15	J - 4
CN2	D - 4	E10	M - 1	Q2	A - 1	Q28	G - 2	RV2	C - 2	TP16	J - 5
CN3	D - 4			Q3	B - 1	Q29	G - 2	RV3	E - 1	TP17	K - 5
CN4	H - 1	FL1	J - 2	Q4	A - 2	Q30	H - 2	RV4	C - 5	TP18	K - 5
CN5	M - 2	FL2	M - 4	Q5	A - 2	Q31	H - 2	RV5	D - 5	TP19	K - 5
CN6	M - 2			Q6	B - 2	Q32	G - 2	RV6	E - 4	TP20	L - 2
CN7	M - 4	IC1	C - 3	Q7	E - 2	Q33	G - 3	RV7	E - 3	TP21	M - 3
CN8	M - 3	IC2	D - 2	Q8	E - 4	Q34	J - 3	RV8	G - 5	TP22	M - 3
		IC3	D - 4	Q9	E - 2	Q35	J - 3	RV9	G - 4	TP23	M - 1
CV1	H - 5	IC4	K - 4	Q10	D - 1	Q36	J - 4	RV10	K - 3	TPA	K - 2
		IC5	G - 5	Q11	D - 1	Q37	J - 4	RV11	J - 4		
D3	L - 3	IC6	G - 3	Q12	A - 3	Q38	I - 4				
D4	L - 3	IC7	I - 5	Q13	A - 4	Q39	J - 4	TP1	A - 2		
D5	D - 4	IC8	H - 2	Q14	A - 4	Q40	I - 5	TP2	B - 1		
		IC9	I - 3	Q15	D - 5	Q41	J - 5	TP3	B - 2		
DL1	E - 2	IC10	K - 2	Q16	D - 4	Q42	L - 5	TP4	D - 3		
DL2	A - 4	IC11	J - 2	Q17	E - 5	Q43	L - 4	TP5	D - 2		
		IC12	L - 2	Q18	E - 5	Q44	L - 3	TP6	D - 2		
E1	A - 2	IC13	L - 2	Q19	B - 5	Q45	M - 2	TP7	D - 2		
E2	A - 5	IC14	K - 2	Q20	A - 5	Q46	M - 4	TP8	B - 3		
E3	E - 3	IC15	G - 1	Q21	C - 4	Q47	J - 2	TP9	C - 4		
E4	F - 2	IC16	I - 2	Q22	C - 4	Q48	G - 1	TP10	C - 4		
E5	E - 2	IC17	G - 3	Q23	C - 4	Q49	I - 1	TP11	B - 5		
E6	I - 3			Q24	F - 4	Q50	F - 2	TP12	C - 5		
E7	E - 5			Q25	E - 5	Q51	E - 2	TP13	F - 5		
E8	K - 2			Q26	F - 4			TP14	F - 4		

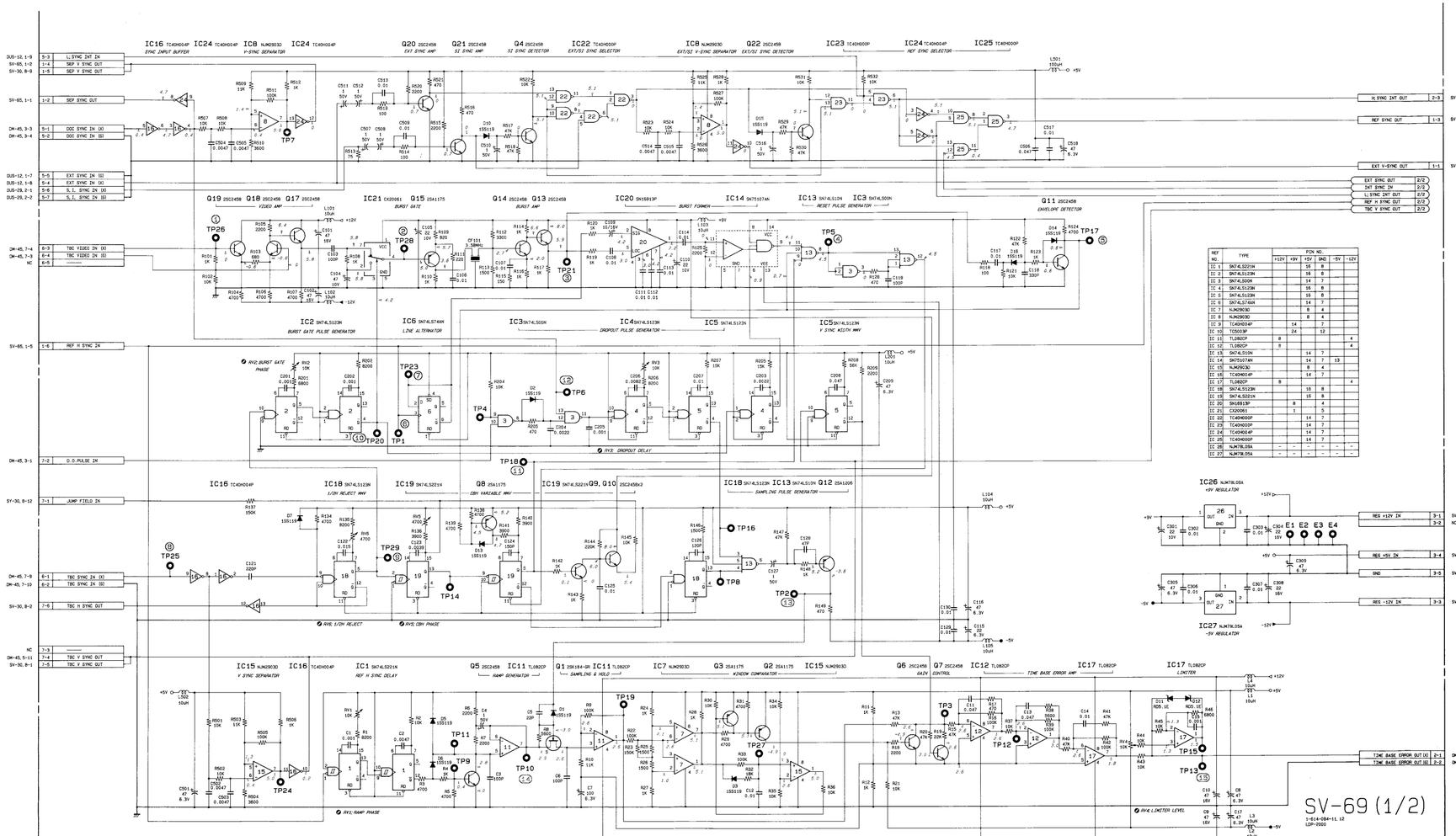
SV-69 (TBC)



SV-69 — SOLDERING SIDE —
1-614-084-12
LDP-2000

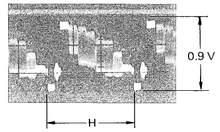
CF101	H - 4	E1	L - 1	IC21	G - 3	Q19	F - 4	TP15	K - 3
		E2	A - 1	IC22	D - 4	Q20	D - 4	TP16	I - 2
CN1	A - 4	E3	L - 4	IC23	C - 4	Q21	D - 4	TP17	I - 3
CN2	K - 4	E4	A - 3	IC24	B - 4	Q22	C - 3	TP18	I - 4
CN3	L - 3			IC25	B - 4			TP19	H - 2
CN5	E - 4	IC1	L - 1	IC26	L - 4	RV2	J - 1	TP20	H - 2
CN6	F - 3	IC2	J - 1	IC27	L - 3	RV3	H - 1	TP21	H - 4
CN7	K - 4	IC3	I - 1			RV4	K - 2	TP23	G - 2
		IC4	I - 1	Q1	K - 1	RV5	J - 3	TP24	H - 2
CV1	A - 2	IC5	H - 1	Q2	F - 1	RV6	J - 4	TP25	F - 3
		IC6	G - 1	Q3	F - 1			TP26	F - 3
D1	K - 1	IC7	F - 1	Q4	C - 1	TP1	K - 1	TP27	E - 3
D2	J - 1	IC8	D - 2	Q5	L - 2	TP2	K - 1	TP28	G - 4
D3	F - 2	IC9	C - 2	Q6	J - 2	TP3	K - 2	TP29	I - 2
D4	B - 1	IC10	B - 2	Q7	J - 2	TP4	J - 2		
D5	L - 2	IC11	L - 2	Q8	I - 4	TP5	I - 1	X401	B - 2
D6	L - 2	IC12	L - 2	Q9	I - 4	TP6	I - 1		
D7	H - 3	IC13	I - 2	Q10	I - 3	TP7	D - 1		
D10	C - 2	IC14	H - 3	Q11	I - 4	TP8	K - 3		
D11	K - 3	IC15	F - 2	Q12	H - 3	TP9	L - 2		
D12	K - 3	IC16	E - 2	Q13	H - 4	TP10	L - 2		
D13	I - 4	IC17	K - 3	Q14	H - 4	TP11	L - 2		
D14	I - 4	IC18	K - 3	Q15	G - 4	TP12	L - 3		
D15	C - 4	IC19	J - 4	Q17	F - 4	TP13	L - 4		
D16	H - 4	IC20	H - 3	Q18	F - 4	TP14	J - 3		

SV-69 (TBC)


IC16 TC4W04P IC24 TC4W04P IC8 NJM2903D IC24 TC4W04P
SYNC INPUT BUFFER V-SYNC SEPARATOR
Q20 2SC2458 Q21 2SC2458 Q4 2SC2458 IC22 TC4W00P IC8 NJM2903D Q22 2SC2458 IC23 TC4W00P IC24 TC4W04P IC25 TC4W00P
EXT SYNC AMP S1 SYNC AMP S1 SYNC DETECTOR EXT/S1 SYNC SELECTOR EXT/S1 V-SYNC SEPARATOR EXT/S1 SYNC DETECTOR REF SYNC SELECTOR
DU5-12, 1-9 5-3 L SYNC INT IN
SV-65, 1-2 1-4 SEP V SYNC OUT
SV-30, 8-9 1-5 SEP V SYNC OUT
SV-65, 1-1 1-2 SEP SYNC OUT
DM-45, 3-3 5-1 DOC SYNC IN (X)
DM-45, 3-4 5-2 DOC SYNC IN (S)
DU5-12, 1-7 5-5 EXT SYNC IN (S)
DU5-12, 1-8 5-4 EXT SYNC IN (X)
DU5-29, 2-1 5-6 S. L SYNC IN (X)
DU5-29, 2-2 5-7 S. L SYNC IN (S)
H SYNC INT OUT 2-3
REF SYNC OUT 1-3
EXT V-SYNC OUT 1-1
EXT SYNC OUT 2/2
INT SYNC IN 2/2
L SYNC INT OUT 2/2
REF H SYNC OUT 2/2
TBC V SYNC OUT 2/2
Q19 2SC2458 Q18 2SC2458 Q17 2SC2458
VIDEO AMP
IC21 CX20061 Q15 2SA1175 Q14 2SC2458 Q13 2SC2458 IC20 SN16913P IC14 SN75107AN IC13 SN74LS10N IC3 SN74LS00N
BURST GATE BURST AMP BURST FORMER RESET PULSE GENERATOR
Q11 2SC2458
ENVELOPE DETECTOR
DM-45, 7-4 6-3 TBC VIDEO IN (X)
DM-45, 7-3 6-4 TBC VIDEO IN (S)
NC 6-5 ——
IC2 SN74LS123N IC6 SN74LS74AN IC3 SN74LS00N IC4 SN74LS123N IC5 SN74LS123N IC5 SN74LS123N
BURST GATE PULSE GENERATOR LINE ALTERNATOR DROPOUT PULSE GENERATOR V SYNC WIDTH MMV
SV-65, 1-5 1-6 REF H SYNC IN
RV2: BURST GATE PHASE
RV3: DROPOUT DELAY
DM-45, 3-1 7-2 D.O.PULSE IN
SY-30, 8-12 7-1 JUMP FIELD IN
IC16 TC4W04P IC18 SN74LS123N IC19 SN74LS221N IC19 SN74LS221N Q9, Q10 2SC458x2 IC18 SN74LS123N IC13 SN74LS10N Q12 2SA1206
1/2H REJECT MMV CBH VARIABLE MMV SAMPLING PULSE GENERATION
Q8 2SA1175
RV5: 1/2H REJECT RV6: CBH PHASE
DM-45, 7-9 6-1 TBC SYNC IN (X)
DM-45, 7-10 6-2 TBC SYNC IN (S)
SV-30, 8-2 7-6 TBC H SYNC OUT
NC 7-3 ——
DM-45, 5-11 7-4 TBC V SYNC OUT
SV-30, 8-1 7-5 TBC V SYNC OUT
IC15 NJM2903D IC16 TC4W04P IC1 SN74LS221N Q5 2SC2458 IC11 TL082CP Q1 2SK184-GR IC11 TL082CP IC7 NJM2903D Q3 2SA1175 IC15 NJM2903D Q6 2SC2458 Q7 2SC2458 IC12 TL082CP IC17 TL082CP IC17 TL082CP
V SYNC SEPARATOR REF H SYNC DELAY RAMP GENERATOR SAMPLING & HOLD KINDEN COMPARATOR GAIN CONTROL TIME BASE ERROR AMP LIMITER
RV1: RAMP PHASE RV4: LIMITER LEVEL
TIME BASE ERROR OUT (X) 2-1
TIME BASE ERROR OUT (S) 2-2
IC26 NJM78L05A
+5V REGULATION
IC27 NJM79L05A
-5V REGULATION
REG +12V IN 3-1
NC 3-2
REG +5V IN 3-4
GND 3-5
REG -12V IN 3-3
SV-65, 2-6
SV-65, 2-8
SV-65, 2-4
SV-65, 2-2
SV-65, 4-7
SV-65, 4-8
SV-69 (1/2)
1-614-084-11, 12
LDP-2000

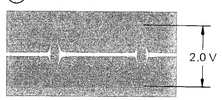
REF NO.	TYPE	PIN NO. +12V	+9V	+5V	GND	-5V	-12V
IC 1	SN74LS221N			16	8		
IC 2	SN74LS123N			16	8		
IC 3	SN74LS00N			14	7		
IC 4	SN74LS123N			16	8		
IC 5	SN74LS123N			16	8		
IC 6	SN74LS74AN			14	7		
IC 7	NJM2903D			8	4		
IC 8	NJM2903D			8	4		
IC 9	TC4W04P		14		7		
IC 10	TC5013P		24		12		
IC 11	TL082CP	8					4
IC 12	TL082CP	8					4
IC 13	SN74LS10N			14	7		
IC 14	SN75107AN			14	7	13	
IC 15	NJM2903D			8	4		
IC 16	TC4W04P			14	7		
IC 17	TL082CP	8					4
IC 18	SN74LS123N			16	8		
IC 19	SN74LS221N			16	8		
IC 20	SN16913P		8		4		
IC 21	CX20061		1		5		
IC 22	TC4W00P			14	7		
IC 23	TC4W00P			14	7		
IC 24	TC4W04P			14	7		
IC 25	TC4W00P			14	7		
IC 26	NJM78L05A	–	–	–	–	–	–
IC 27	NJM79L05A	–	–	–	–	–	–

① TP26



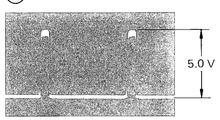
② TP28

③ TP21

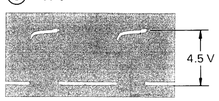


④ TP5

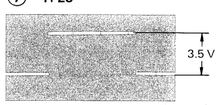
⑤ TP17



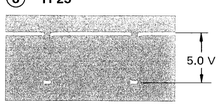
⑥ TP1



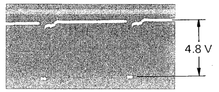
⑦ TP23



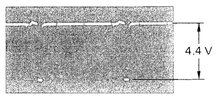
⑧ TP25



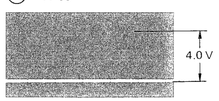
⑨ TP29



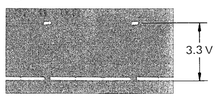
⑩ TP20



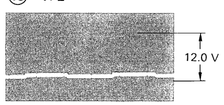
⑪ TP18



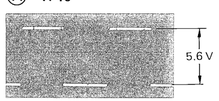
⑫ TP6



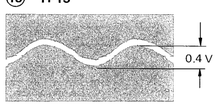
⑬ TP2



⑭ TP10

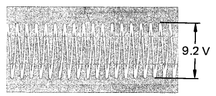


⑮ TP13

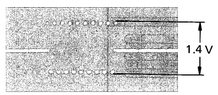


SV-69 (SYNC GENERATOR)
SG-102
SG-103

⑯ **IC 10-1**



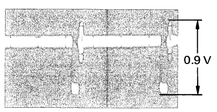
⑲ **IC 1-4**



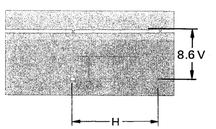
⑰ **IC 10-22**

3.58 MHz

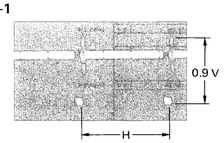
⑳ **Q4-E**

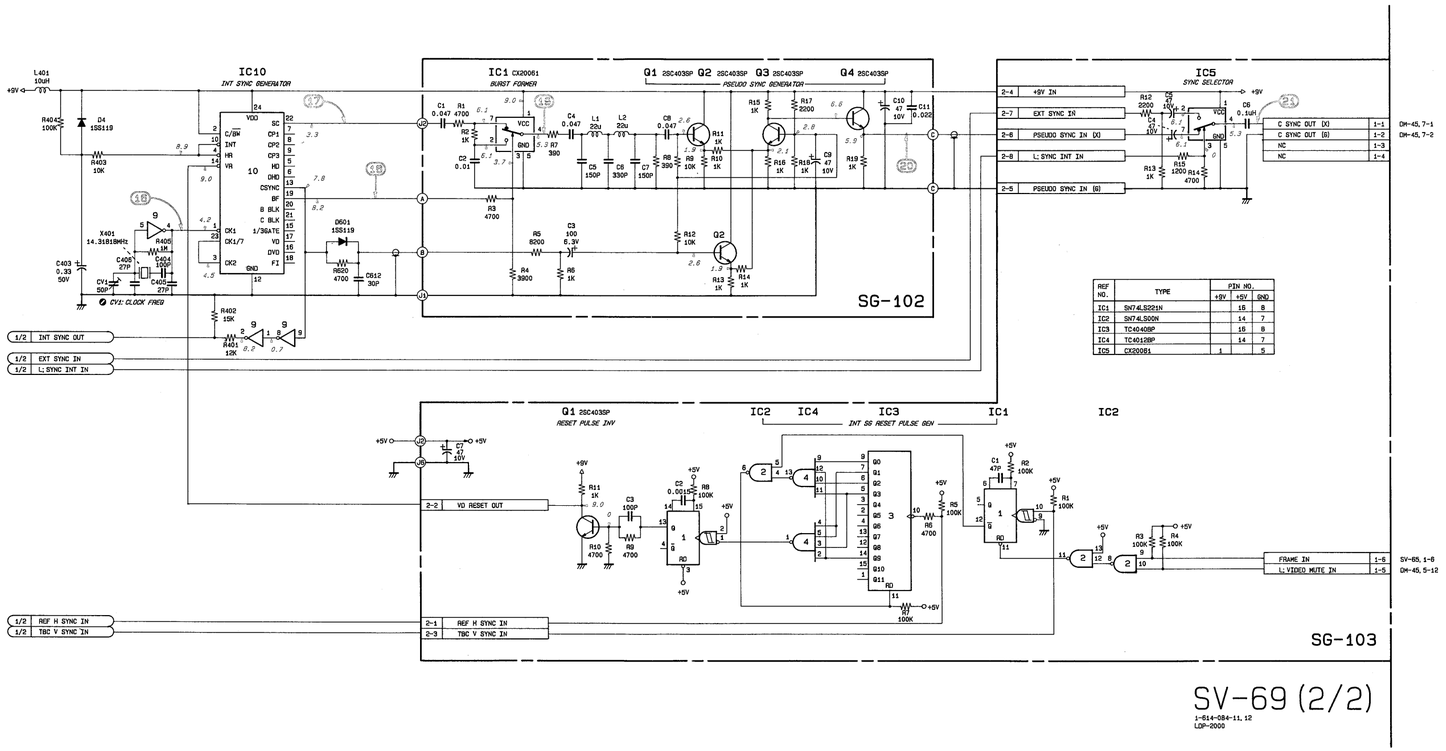


⑱ **IC 10-19**



㉑ **CN1-1**



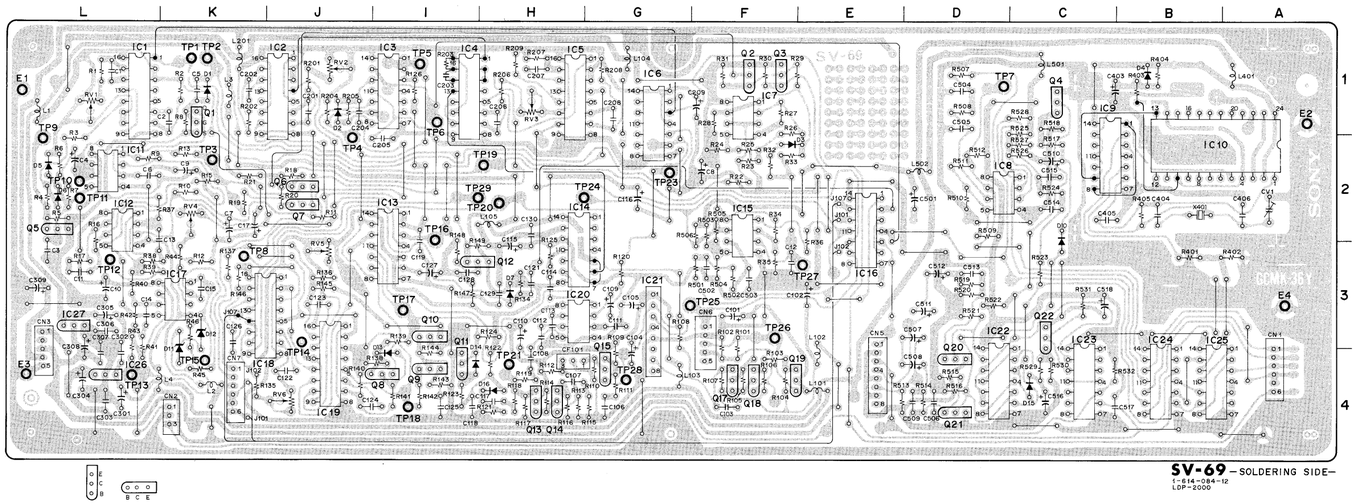


REF NO.	TYPE	PIN NO.		
		+9V	+5V	GND
IC1	SN74LS221N		16	8
IC2	SN74LS00N		14	7
IC3	TC4040BP		16	8
IC4	TC4012BP		14	7
IC5	CX20061	1		5

SV-69 (2/2)

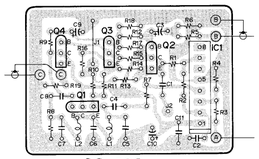
1-614-084-11, 12
LDP-2000

SV-69 (SYNC GENERATOR)
SG-102
SG-103

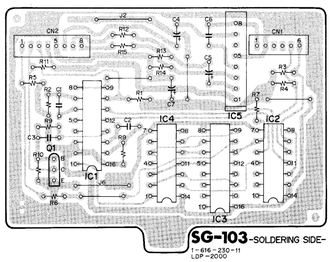


SV-69 – SOLDERING SIDE –
1-614-084-12
LDP-2000

CF101	H - 4	E1	L - 1	IC21	G - 3	Q19	F - 4	TP15	K - 3
		E2	A - 1	IC22	D - 4	Q20	D - 4	TP16	I - 2
CN1	A - 4	E3	L - 4	IC23	C - 4	Q21	D - 4	TP17	I - 3
CN2	K - 4	E4	A - 3	IC24	B - 4	Q22	C - 3	TP18	I - 4
CN3	L - 3			IC25	B - 4			TP19	H - 2
CN5	E - 4	IC1	L - 1	IC26	L - 4	RV2	J - 1	TP20	H - 2
CN6	F - 3	IC2	J - 1	IC27	L - 3	RV3	H - 1	TP21	H - 4
CN7	K - 4	IC3	I - 1			RV4	K - 2	TP23	G - 2
		IC4	I - 1	Q1	K - 1	RV5	J - 3	TP24	H - 2
CV1	A - 2	IC5	H - 1	Q2	F - 1	RV6	J - 4	TP25	F - 3
		IC6	G - 1	Q3	F - 1			TP26	F - 3
D1	K - 1	IC7	F - 1	Q4	C - 1	TP1	K - 1	TP27	E - 3
D2	J - 1	IC8	D - 2	Q5	L - 2	TP2	K - 1	TP28	G - 4
D3	F - 2	IC9	C - 2	Q6	J - 2	TP3	K - 2	TP29	I - 2
D4	B - 1	IC10	B - 2	Q7	J - 2	TP4	J - 2		
D5	L - 2	IC11	L - 2	Q8	I - 4	TP5	I - 1	X401	B - 2
D6	L - 2	IC12	L - 2	Q9	I - 4	TP6	I - 1		
D7	H - 3	IC13	I - 2	Q10	I - 3	TP7	D - 1		
D10	C - 2	IC14	H - 3	Q11	I - 4	TP8	K - 3		
D11	K - 3	IC15	F - 2	Q12	H - 3	TP9	L - 2		
D12	K - 3	IC16	E - 2	Q13	H - 4	TP10	L - 2		
D13	I - 4	IC17	K - 3	Q14	H - 4	TP11	L - 2		
D14	I - 4	IC18	K - 3	Q15	G - 4	TP12	L - 3		
D15	C - 4	IC19	J - 4	Q17	F - 4	TP13	L - 4		
D16	H - 4	IC20	H - 3	Q18	F - 4	TP14	J - 3		



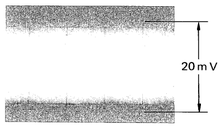
SG-102 – COMPONENT SIDE –
1-616-229-11
LDP-2000



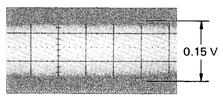
SG-103 – SOLDERING SIDE –
1-616-230-11
LDP-2000

SA-16 (AUDIO SYSTEM)

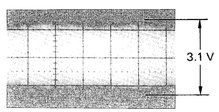
① TP1



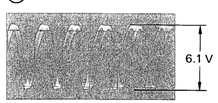
② TP2



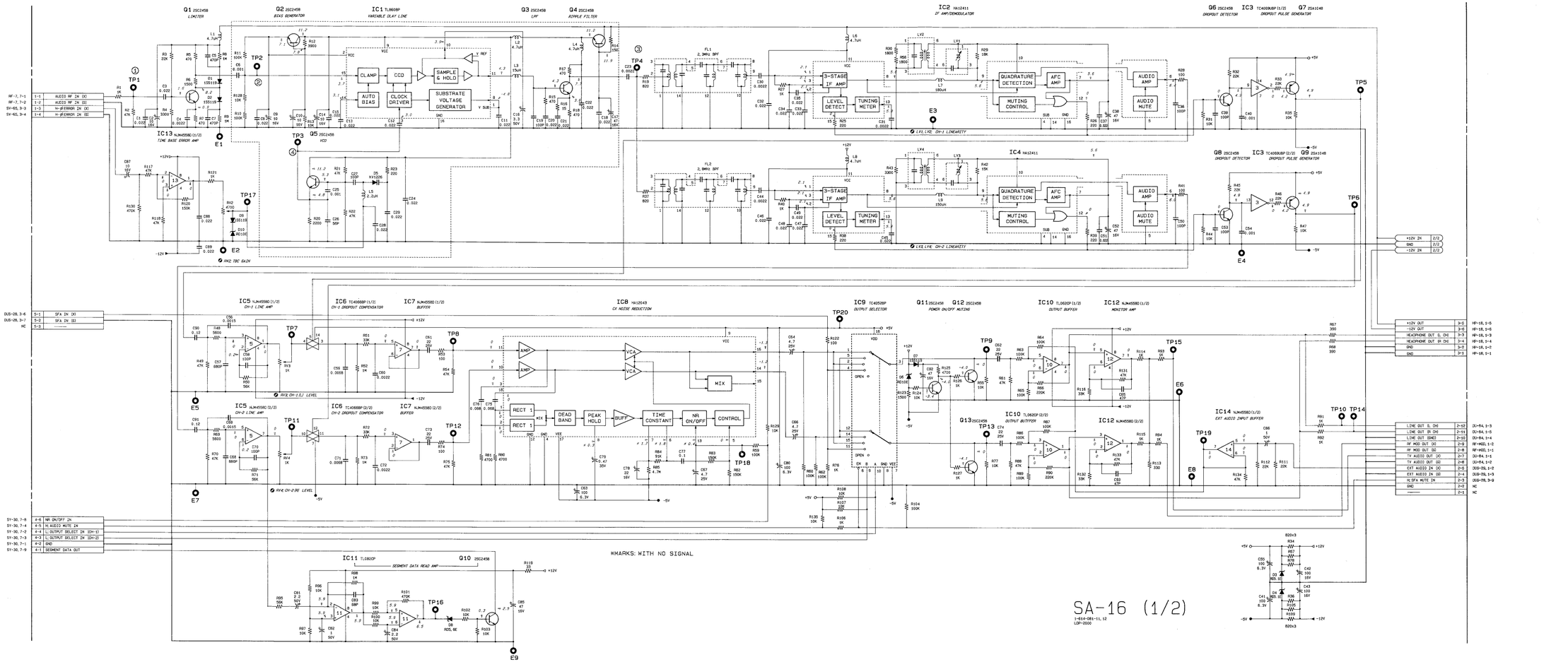
③ TP4



④ TP3

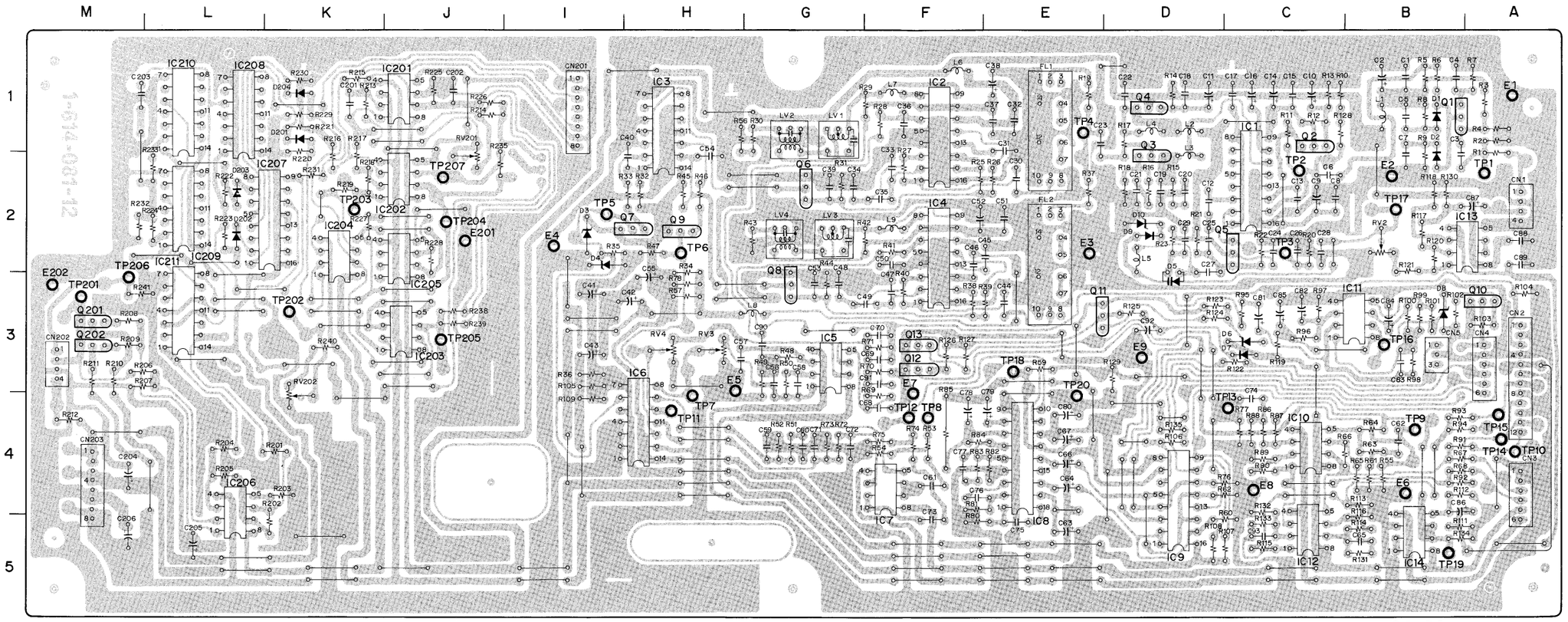


9 MHz (T=110 nS)



SA-16 (1/2)

SA-16 (AUDIO SYSTEM)



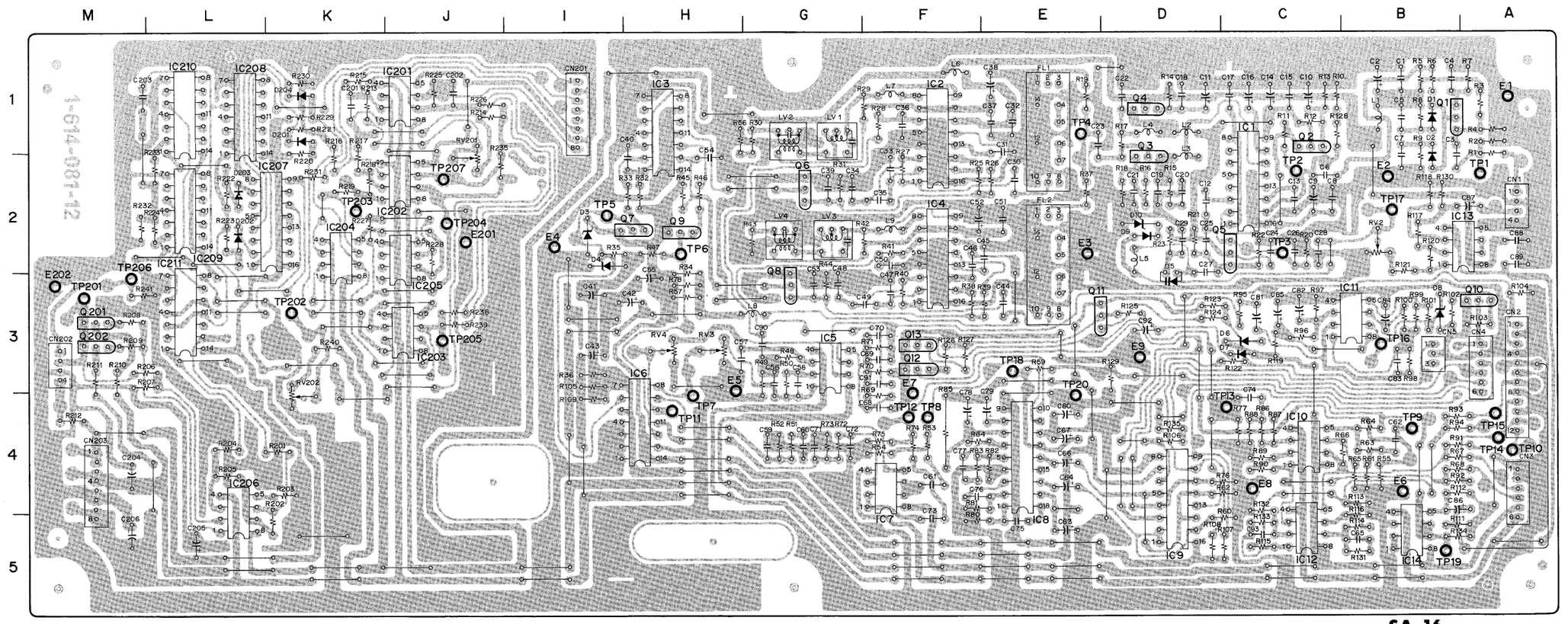
SA-16 – SOLDERING SIDE –

1-614-081-12
LDP-2000

E C B

CN1	A - 2	E1	A - 1	IC10	C - 4	Q1	B - 1	TP1	A - 2	TP205	J - 3
CN2	A - 3	E2	B - 2	IC11	B - 3	Q2	C - 1	TP2	C - 2	TP206	M - 3
CN3	A - 4	E3	E - 2	IC12	C - 5	Q3	D - 2	TP3	C - 2	TP207	J - 2
CN4	A - 3	E4	I - 2	IC13	A - 2	Q4	D - 1	TP4	E - 1		
CN5	B - 3	E5	H - 3	IC14	B - 5	Q5	C - 2	TP5	I - 2		
CN201	I - 1	E6	B - 4	IC201	J - 1	Q6	G - 2	TP6	H - 2		
CN202	M - 3	E7	F - 3	IC202	J - 2	Q7	H - 2	TP7	H - 4		
CN203	M - 4	E8	C - 4	IC203	J - 3	Q8	G - 3	TP8	F - 4		
		E9	D - 3	IC204	K - 2	Q9	H - 2	TP9	B - 4		
D1	B - 1	E201	J - 2	IC205	J - 2	Q10	A - 3	TP10	A - 4		
D2	B - 2	E202	M - 3	IC206	L - 4	Q11	E - 3	TP11	H - 4		
D3	I - 2			IC207	K - 2	Q12	F - 3	TP12	F - 4		
D4	I - 2	FL1	E - 1	IC208	L - 1	Q13	F - 3	TP13	C - 4		
D5	D - 3	FL2	E - 2	IC209	L - 2	Q201	M - 3	TP14	A - 4		
D6	C - 3			IC210	L - 1	Q202	M - 3	TP15	A - 4		
D7	C - 3	IC1	C - 2	IC211	L - 3			TP16	B - 3		
D8	B - 3	IC2	F - 1			RV2	B - 2	TP17	B - 2		
D9	D - 2	IC3	H - 1	LV1	G - 1	RV3	H - 3	TP18	E - 3		
D10	D - 2	IC4	F - 2	LV2	G - 1	RV4	H - 3	TP19	B - 5		
D201	K - 1	IC5	G - 3	LV3	G - 2	RV201	J - 2	TP20	E - 4		
D202	L - 2	IC6	H - 4	LV4	G - 2	RV202	K - 4	TP201	M - 3		
D203	L - 2	IC7	F - 4					TP202	K - 3		
D204	K - 1	IC8	E - 4					TP203	K - 2		
		IC9	D - 4					TP204	J - 2		

SA-16 (SKEW SERVO)



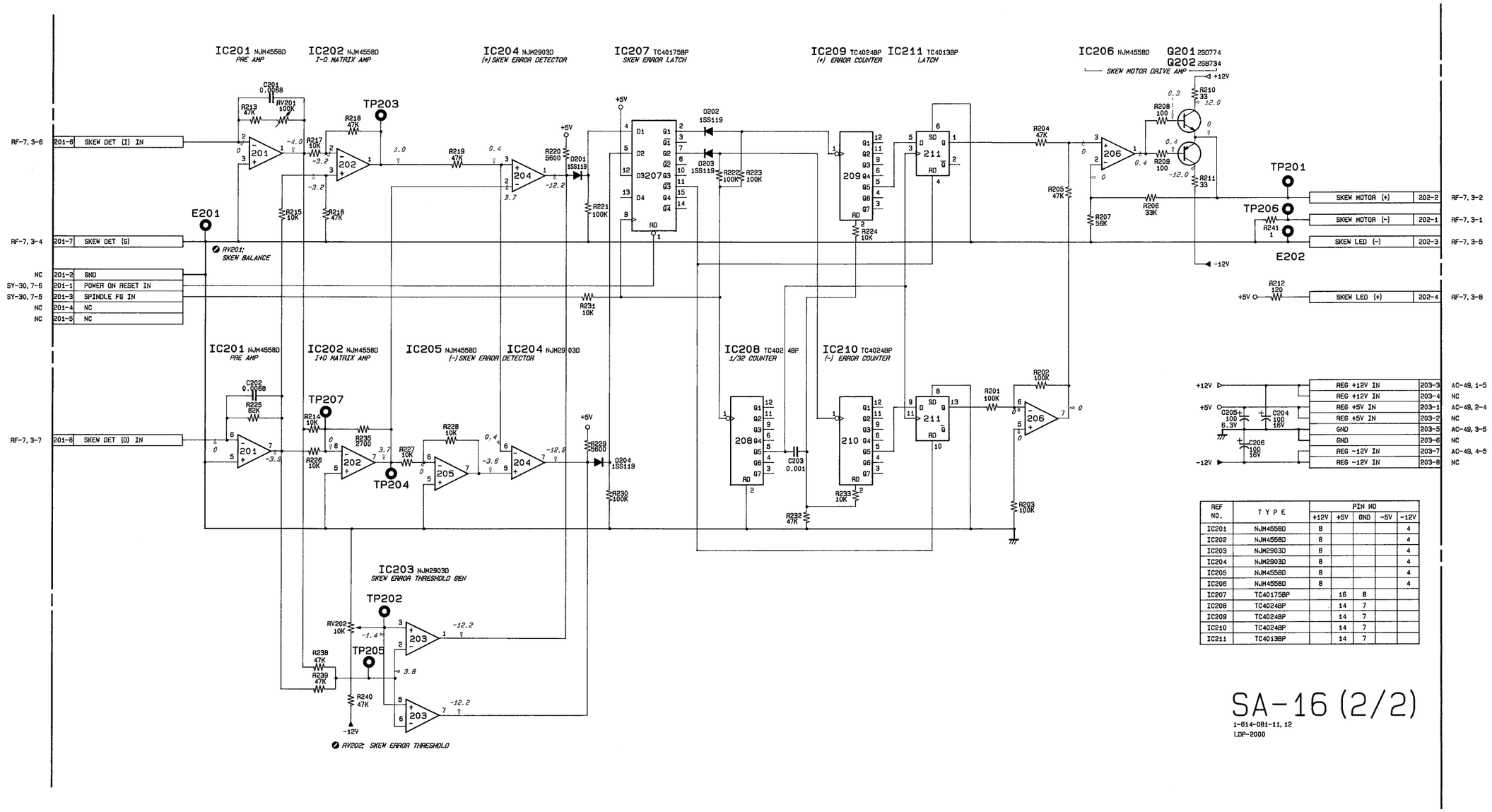
SA-16 – SOLDERING SIDE –
1-614-081-12
LDP-2000

E C B

E C B

CN1	A - 2	E1	A - 1	IC10	C - 4	Q1	B - 1	TP1	A - 2	TP205	J - 3
CN2	A - 3	E2	B - 2	IC11	B - 3	Q2	C - 1	TP2	C - 2	TP206	M - 3
CN3	A - 4	E3	E - 2	IC12	C - 5	Q3	D - 2	TP3	C - 2	TP207	J - 2
CN4	A - 3	E4	I - 2	IC13	A - 2	Q4	D - 1	TP4	E - 1		
CN5	B - 3	E5	H - 3	IC14	B - 5	Q5	C - 2	TP5	I - 2		
CN201	I - 1	E6	B - 4	IC201	J - 1	Q6	G - 2	TP6	H - 2		
CN202	M - 3	E7	F - 3	IC202	J - 2	Q7	H - 2	TP7	H - 4		
CN203	M - 4	E8	C - 4	IC203	J - 3	Q8	G - 3	TP8	F - 4		
		E9	D - 3	IC204	K - 2	Q9	H - 2	TP9	B - 4		
D1	B - 1	E201	J - 2	IC205	J - 2	Q10	A - 3	TP10	A - 4		
D2	B - 2	E202	M - 3	IC206	L - 4	Q11	E - 3	TP11	H - 4		
D3	I - 2			IC207	K - 2	Q12	F - 3	TP12	F - 4		
D4	I - 2	FL1	E - 1	IC208	L - 1	Q13	F - 3	TP13	C - 4		
D5	D - 3	FL2	E - 2	IC209	L - 2	Q201	M - 3	TP14	A - 4		
D6	C - 3			IC210	L - 1	Q202	M - 3	TP15	A - 4		
D7	C - 3	IC1	C - 2	IC211	L - 3			TP16	B - 3		
D8	B - 3	IC2	F - 1			RV2	B - 2	TP17	B - 2		
D9	D - 2	IC3	H - 1	LV1	G - 1	RV3	H - 3	TP18	E - 3		
D10	D - 2	IC4	F - 2	LV2	G - 1	RV4	H - 3	TP19	B - 5		
D201	K - 1	IC5	G - 3	LV3	G - 2	RV201	J - 2	TP20	E - 4		
D202	L - 2	IC6	H - 4	LV4	G - 2	RV202	K - 4	TP201	M - 3		
D203	L - 2	IC7	F - 4					TP202	K - 3		
D204	K - 1	IC8	E - 4					TP203	K - 2		
		IC9	D - 4					TP204	J - 2		

SA-16 (SKEW SERVO)

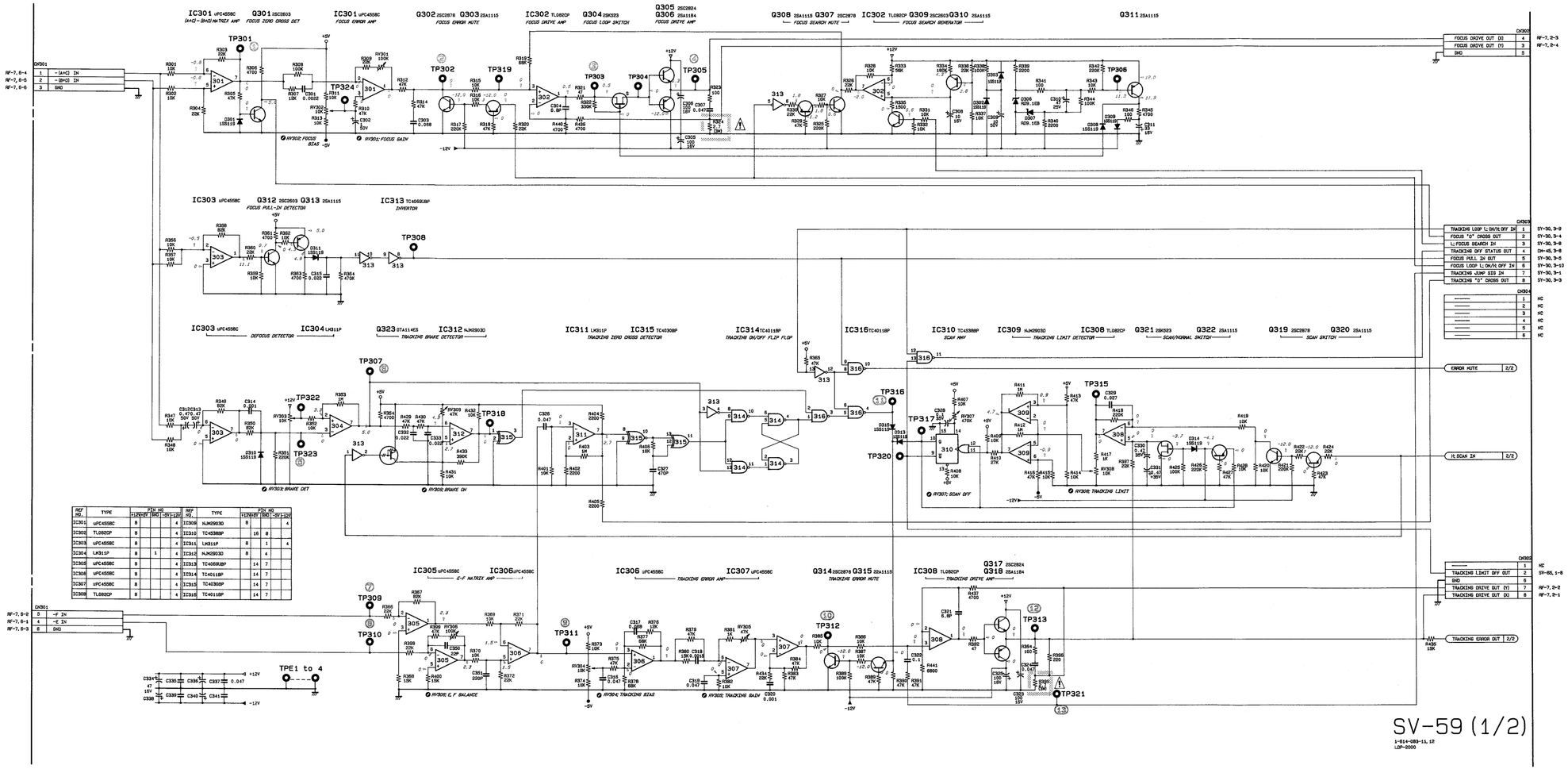

IC201 NJM4558D PRE AMP
IC202 NJM4558D I-O MATRIX AMP
IC204 NJM2903D (+)SKEW ERROR DETECTOR
IC207 TC40175BP SKEW ERROR LATCH
IC209 TC4024BP (+) ERROR COUNTER
IC211 TC4013BP LATCH
IC206 NJM4558D
Q201 2SD774
Q202 2SB734
SKEW MOTOR DRIVE AMP
IC205 NJM4558D (-)SKEW ERROR DETECTOR
IC208 TC4024BP 1/32 COUNTER
IC210 TC4024BP (-) ERROR COUNTER
IC203 NJM2903D SKEW ERROR THRESHOLD GEN
RF-7, 3-6 201-6 SKEW DET (I) IN
RF-7, 3-4 201-7 SKEW DET (G)
NC 201-2 GND
SY-30, 7-6 201-1 POWER ON RESET IN
SY-30, 7-5 201-3 SPINDLE FG IN
NC 201-4 NC
NC 201-5 NC
RF-7, 3-7 201-8 SKEW DET (O) IN
AV201: SKEW BALANCE
AV202: SKEW ERROR THRESHOLD
SKEW MOTOR (+) 202-2 RF-7, 3-2
SKEW MOTOR (-) 202-1 RF-7, 3-1
SKEW LED (-) 202-3 RF-7, 3-5
SKEW LED (+) 202-4 RF-7, 3-8
REG +12V IN 203-3 AC-49, 1-5
REG +12V IN 203-4 NC
REG +5V IN 203-1 AC-49, 2-4
REG +5V IN 203-2 NC
GND 203-5 AC-49, 3-5
GND 203-6 NC
REG -12V IN 203-7 AC-49, 4-5
REG -12V IN 203-8 NC

REF NO.	TYPE	PIN NO				
		+12V	+5V	GND	-5V	-12V
IC201	NJM4558D	8				4
IC202	NJM4558D	8				4
IC203	NJM2903D	8				4
IC204	NJM2903D	8				4
IC205	NJM4558D	8				4
IC206	NJM4558D	8				4
IC207	TC40175BP		16	8		
IC208	TC4024BP		14	7		
IC209	TC4024BP		14	7		
IC210	TC4024BP		14	7		
IC211	TC4013BP		14	7		

SA-16 (2/2)

1-614-081-11, 12
LDP-2000

SV-59 (FOCUS/TRACKING SERVO)



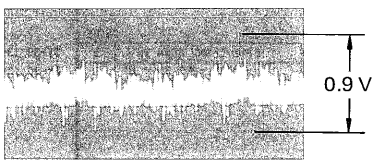
SV-59 (1/2)

1-614-083-11, 12
LDP-2000

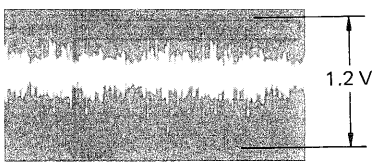
NOTE: The shaded and ⚠ -marked components are critical to safety.
Replace only with same components as specified.

SV-59 (FOCUS/TRACKING SERVO)

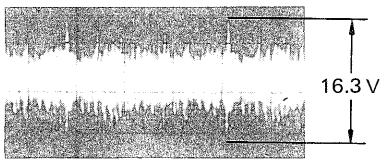
① **TP301**



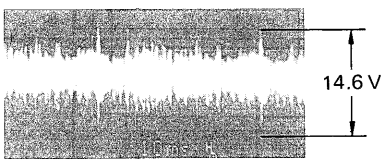
② **TP302**



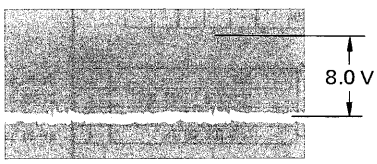
③ **TP303**



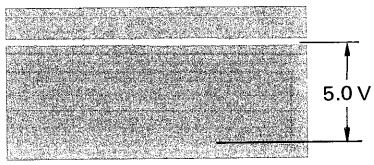
④ **TP305**



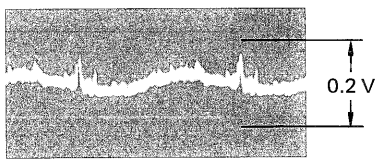
⑤ **TP323** (STILL MODE)



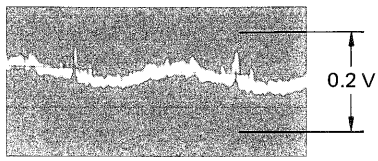
⑥ **TP307** (STILL MODE)



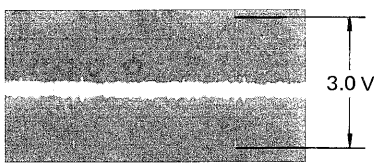
⑦ **TP309** (STILL MODE)



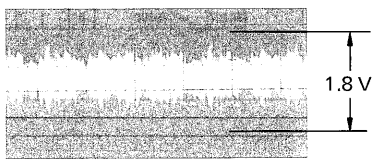
⑧ **TP310** (STILL MODE)



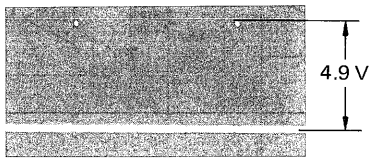
⑨ **TP311** (STILL MODE)



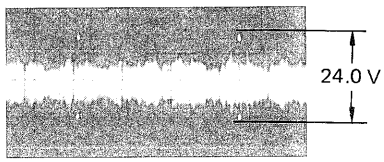
⑩ **TP312** (STILL MODE)



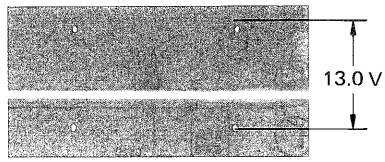
⑪ **TP316** (STILL MODE)



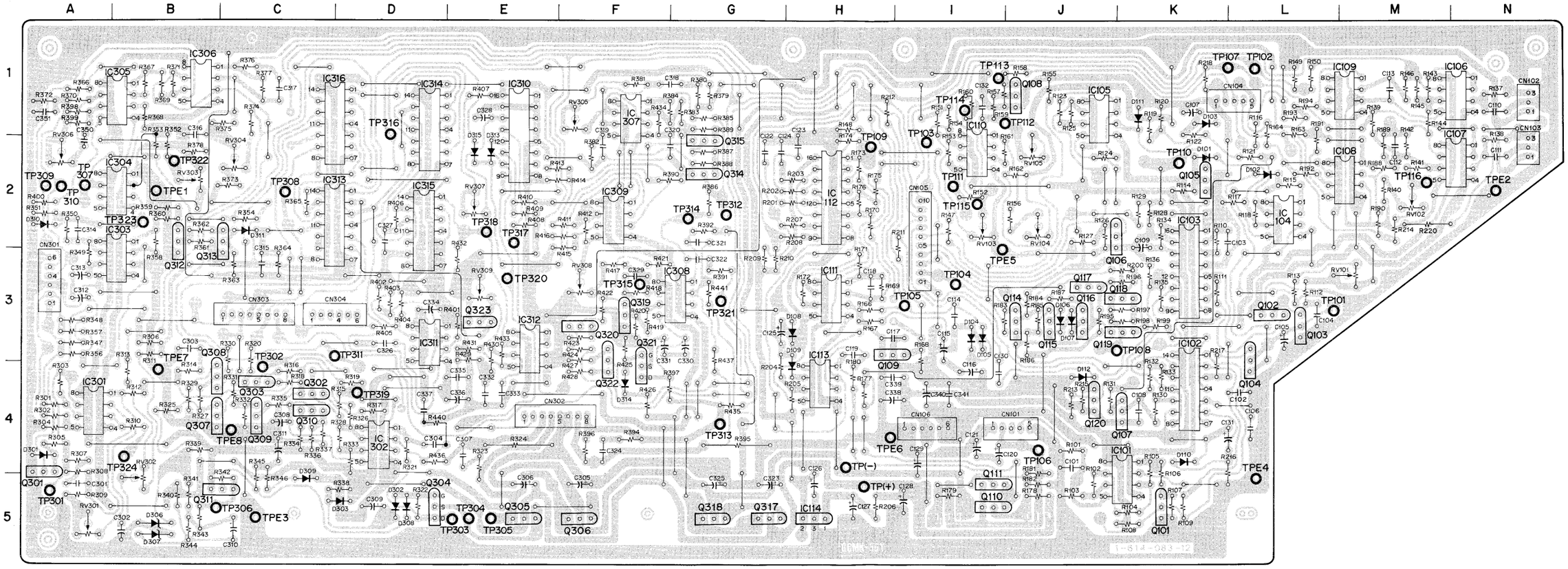
⑫ **TP313** (STILL MODE)



⑬ **TP321** (STILL MODE)



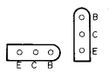
SV-59



SV-59 –SOLDERING SIDE–

1 – 614 – 083 – 12

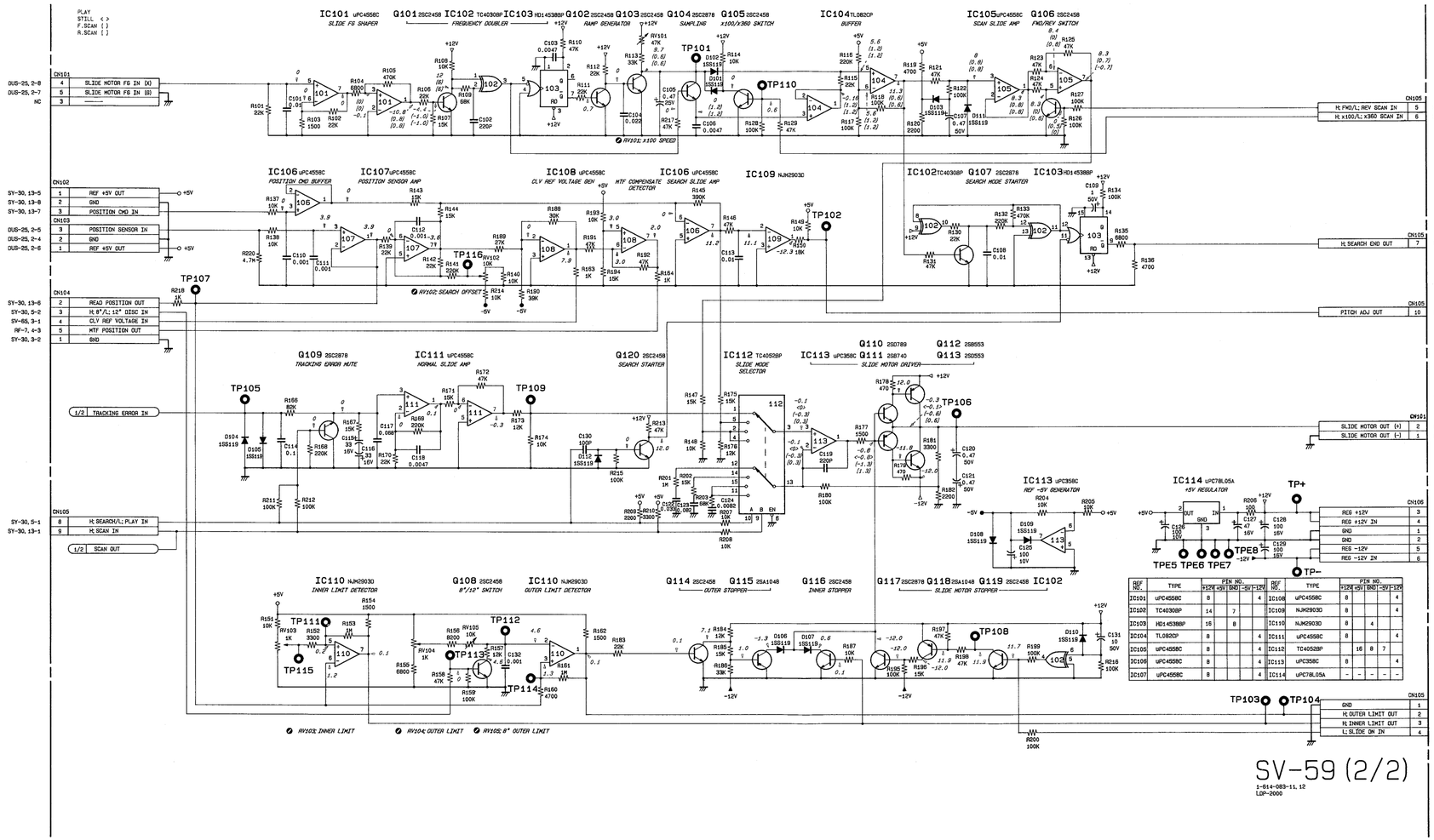
LDP – 2000



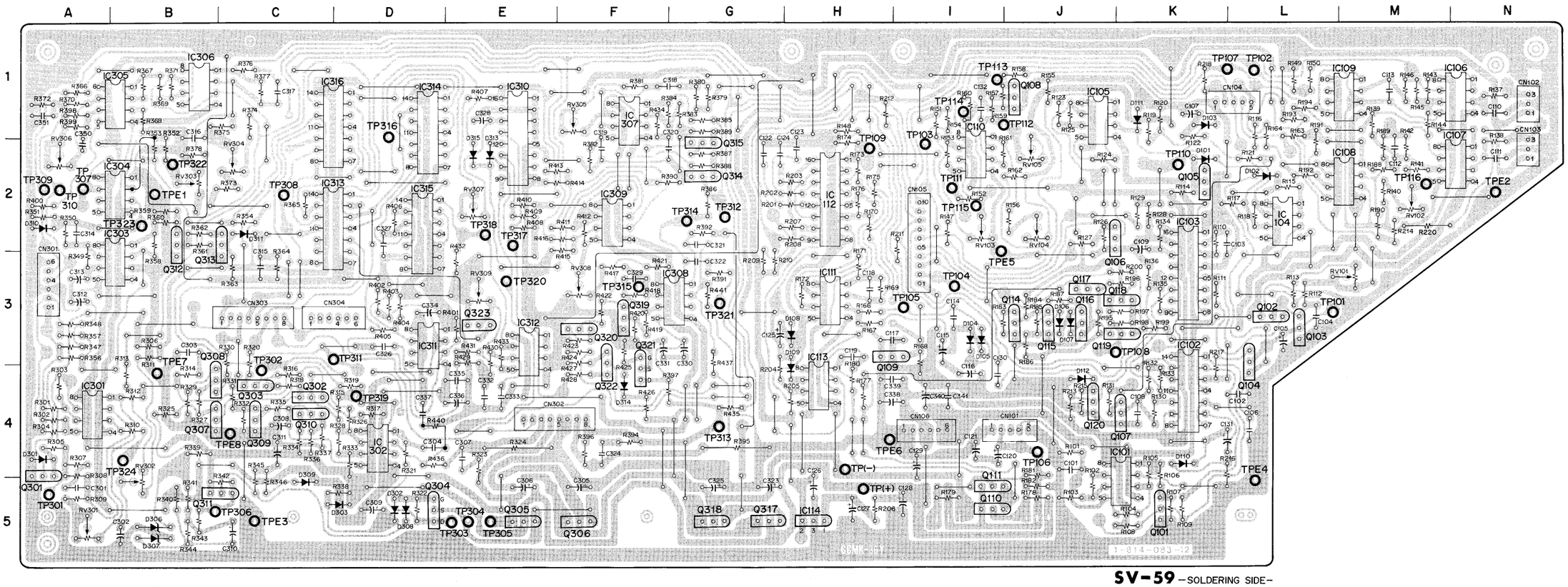
CN101	J - 4	D302	D - 5	IC114	H - 5	Q107	K - 4	Q313	C - 2	RV309	E - 3	TP307	A - 2	TPE6	H - 4
CN102	N - 1	D303	D - 5	IC301	A - 4	Q108	J - 1	Q314	G - 2			TP308	C - 2	TPE7	B - 4
CN103	N - 2	D306	B - 5	IC302	D - 4	Q109	H - 3	Q315	G - 2	TP101	L - 3	TP309	A - 2	TPE8	C - 4
CN104	L - 1	D307	B - 5	IC303	B - 3	Q110	I - 5	Q317	G - 5	TP102	L - 1	TP310	A - 2		
CN105	I - 2	D308	D - 5	IC304	B - 2	Q111	I - 5	Q318	G - 5	TP103	I - 2	TP311	D - 3		
CN106	I - 4	D309	C - 5	IC305	B - 1	Q114	J - 3	Q319	F - 3	TP104	I - 3	TP312	G - 2		
CN301	A - 3	D310	A - 2	IC306	B - 1	Q115	J - 3	Q320	F - 3	TP105	I - 3	TP313	G - 4		
CN302	E - 4	D311	C - 2	IC307	F - 1	Q116	J - 3	Q321	F - 4	TP106	J - 4	TP314	G - 2		
CN303	C - 3	D313	E - 2	IC308	G - 3	Q117	J - 3	Q322	F - 3	TP107	L - 1	TP315	E - 3		
CN304	C - 3	D314	F - 4	IC309	F - 2	Q118	K - 3	Q323	E - 3	TP108	K - 3	TP316	D - 1		
		D315	E - 2	IC310	E - 1	Q119	K - 3			TP109	H - 2	TP317	E - 2		
D101	K - 2			IC311	D - 3	Q120	J - 4	RV101	M - 3	TP110	K - 2	TP318	E - 2		
D102	L - 2	IC101	K - 5	IC312	E - 3	Q301	A - 5	RV102	M - 2	TP111	I - 2	TP319	D - 4		
D103	K - 1	IC102	K - 4	IC313	D - 2	Q302	C - 4	RV103	I - 2	TP112	J - 1	TP320	E - 3		
D104	I - 3	IC103	K - 3	IC314	D - 1	Q303	C - 4	RV104	J - 2	TP113	I - 1	TP321	G - 3		
D105	I - 3	IC104	L - 2	IC315	D - 2	Q304	D - 5	RV105	J - 2	TP114	I - 1	TP322	B - 2		
D106	J - 3	IC105	J - 1	IC316	D - 1	Q305	E - 5	RV301	A - 5	TP115	I - 2	TP323	B - 2		
D107	J - 3	IC106	N - 1			Q306	F - 5	RV302	B - 5	TP116	M - 1	TP324	B - 4		
D108	H - 3	IC107	N - 2	Q101	K - 5	Q307	B - 4	RV303	B - 2	TP301	A - 5				
D109	H - 4	IC108	M - 2	Q102	L - 3	Q308	B - 4	RV304	C - 2	TP302	C - 4	TPE1	B - 2		
D110	K - 4	IC109	M - 1	Q103	L - 3	Q309	C - 4	RV305	F - 1	TP303	E - 5	TPE2	N - 2		
D111	K - 1	IC111	H - 3	Q104	L - 3	Q310	C - 4	RV306	A - 2	TP304	E - 5	TPE3	C - 5		
D112	J - 4	IC112	H - 2	Q105	K - 2	Q311	C - 5	RV307	E - 2	TP305	E - 5	TPE4	L - 5		
D301	A - 4	IC113	H - 4	Q106	K - 2	Q312	B - 2	RV308	F - 3	TP306	B - 5	TPE5	I - 2		

SV-59 SV-59

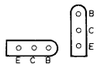
SV-59 (SLIDE SERVO)



SV-59 (SLIDE SERVO)



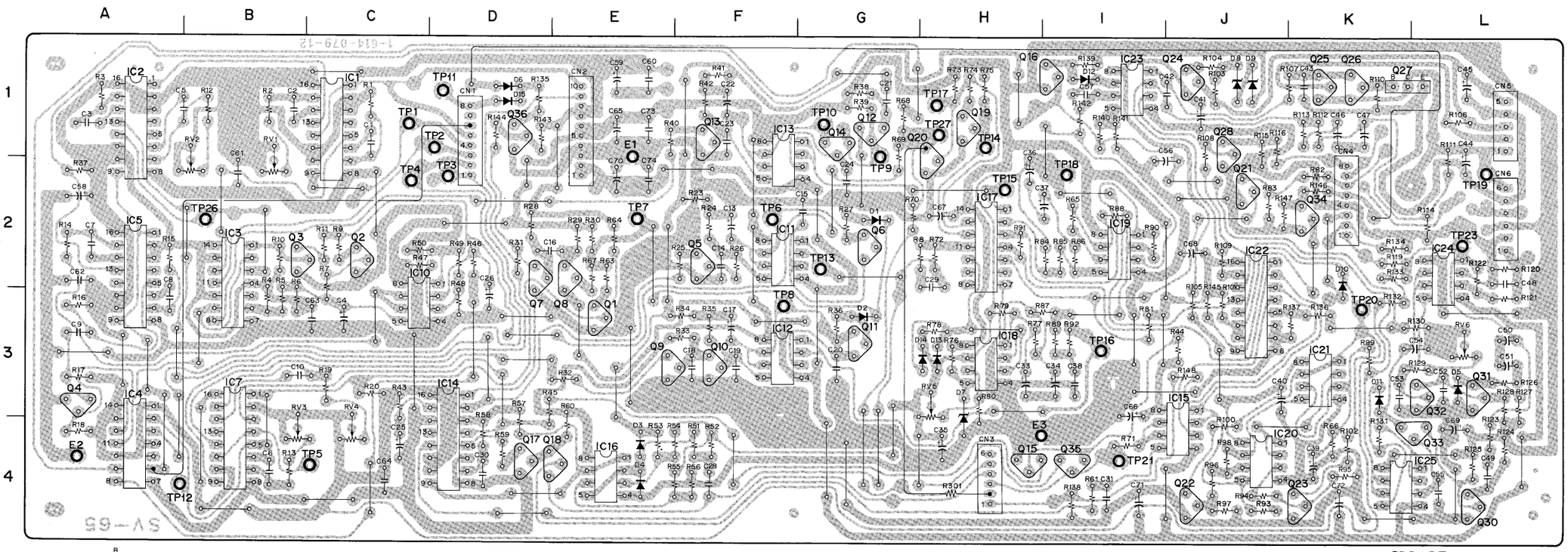
SV-59 —SOLDERING SIDE—
1-614-083-12
LDP-2000

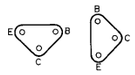


CN101	J - 4	D302	D - 5	IC114	H - 5	Q107	K - 4	Q313	C - 2	RV309	E - 3	TP307	A - 2	TPE6	H - 4
CN102	N - 1	D303	D - 5	IC301	A - 4	Q108	J - 1	Q314	G - 2			TP308	C - 2	TPE7	B - 4
CN103	N - 2	D306	B - 5	IC302	D - 4	Q109	H - 3	Q315	G - 2	TP101	L - 3	TP309	A - 2	TPE8	C - 4
CN104	L - 1	D307	B - 5	IC303	B - 3	Q110	I - 5	Q317	G - 5	TP102	L - 1	TP310	A - 2		
CN105	I - 2	D308	D - 5	IC304	B - 2	Q111	I - 5	Q318	G - 5	TP103	I - 2	TP311	D - 3		
CN106	I - 4	D309	C - 5	IC305	B - 1	Q114	J - 3	Q319	F - 3	TP104	I - 3	TP312	G - 2		
CN301	A - 3	D310	A - 2	IC306	B - 1	Q115	J - 3	Q320	F - 3	TP105	I - 3	TP313	G - 4		
CN302	E - 4	D311	C - 2	IC307	F - 1	Q116	J - 3	Q321	F - 4	TP106	J - 4	TP314	G - 2		
CN303	C - 3	D313	E - 2	IC308	G - 3	Q117	J - 3	Q322	F - 3	TP107	L - 1	TP315	E - 3		
CN304	C - 3	D314	F - 4	IC309	F - 2	Q118	K - 3	Q323	E - 3	TP108	K - 3	TP316	D - 1		
		D315	E - 2	IC310	E - 1	Q119	K - 3			TP109	H - 2	TP317	E - 2		
D101	K - 2			IC311	D - 3	Q120	J - 4	RV101	M - 3	TP110	K - 2	TP318	E - 2		
D102	L - 2	IC101	K - 5	IC312	E - 3	Q301	A - 5	RV102	M - 2	TP111	I - 2	TP319	D - 4		
D103	K - 1	IC102	K - 4	IC313	D - 2	Q302	C - 4	RV103	I - 2	TP112	J - 1	TP320	E - 3		
D104	I - 3	IC103	K - 3	IC314	D - 1	Q303	C - 4	RV104	J - 2	TP113	I - 1	TP321	G - 3		
D105	I - 3	IC104	L - 2	IC315	D - 2	Q304	D - 5	RV105	J - 2	TP114	I - 1	TP322	B - 2		
D106	J - 3	IC105	J - 1	IC316	D - 1	Q305	E - 5	RV301	A - 5	TP115	I - 2	TP323	B - 2		
D107	J - 3	IC106	N - 1			Q306	F - 5	RV302	B - 5	TP116	M - 1	TP324	B - 4		
D108	H - 3	IC107	N - 2	Q101	K - 5	Q307	B - 4	RV303	B - 2	TP301	A - 5				
D109	H - 4	IC108	M - 2	Q102	L - 3	Q308	B - 4	RV304	C - 2	TP302	C - 4	TPE1	B - 2		
D110	K - 4	IC109	M - 1	Q103	L - 3	Q309	C - 4	RV305	F - 1	TP303	E - 5	TPE2	N - 2		
D111	K - 1	IC111	H - 3	Q104	L - 3	Q310	C - 4	RV306	A - 2	TP304	E - 5	TPE3	C - 5		
D112	J - 4	IC112	H - 2	Q105	K - 2	Q311	C - 5	RV307	E - 2	TP305	E - 5	TPE4	L - 5		
D301	A - 4	IC113	H - 4	Q106	K - 2	Q312	B - 2	RV308	F - 3	TP306	B - 5	TPE5	I - 2		

SV-65

SV-65 (SPINDLE SERVO)



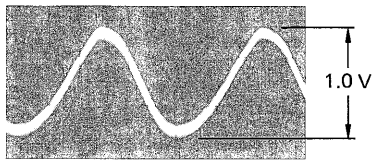


SV-65 – SOLDERING SIDE –

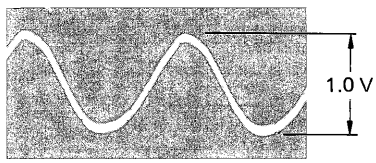
1-614-079-12
LDP-2000

CN1	D - 1	E1	E - 1	Q1	E - 3	Q25	K - 1	TP9	G - 1
CN2	E - 1	E2	A - 4	Q2	C - 2	Q26	K - 1	TP10	G - 1
CN3	H - 4	E3	H - 4	Q3	B - 2	Q27	K - 1	TP11	D - 1
CN4	K - 2			Q4	A - 3	Q28	J - 1	TP12	B - 4
CN5	L - 1	IC1	C - 1	Q5	F - 2	Q30	L - 4	TP13	G - 2
CN6	L - 2	IC2	A - 1	Q6	G - 2	Q31	L - 3	TP14	H - 1
		IC3	B - 2	Q7	D - 2	Q32	L - 3	TP15	H - 2
D1	G - 2	IC4	A - 4	Q8	E - 2	Q33	L - 4	TP16	I - 3
D2	G - 3	IC5	A - 2	Q9	E - 3			TP17	H - 1
D3	E - 4	IC7	B - 4	Q10	F - 3	RV1	B - 2	TP18	I - 2
D4	E - 4	IC10	C - 3	Q11	G - 3	RV2	B - 2	TP19	L - 2
D5	L - 3	IC11	F - 2	Q12	G - 1	RV3	B - 4	TP20	K - 3
D6	D - 1	IC12	F - 3	Q13	F - 1	RV4	C - 4	TP21	I - 4
D7	H - 3	IC13	F - 1	Q14	G - 1	RV5	H - 3	TP23	L - 2
D8	J - 1	IC14	D - 4	Q15	H - 4	RV6	L - 3	TP26	B - 2
D9	J - 1	IC15	J - 4	Q16	I - 1			TP27	H - 1
D10	K - 2	IC17	H - 2	Q17	D - 4	TP1	C - 1		
D11	K - 3	IC18	H - 3	Q18	D - 4	TP2	C - 2		
D12	I - 1	IC19	I - 2	Q19	H - 1	TP3	D - 2		
D13	H - 3	IC20	J - 4	Q20	H - 1	TP4	C - 2		
D14	H - 3	IC21	K - 3	Q21	J - 2	TP5	C - 4		
D15	D - 1	IC22	J - 3	Q22	J - 4	TP6	F - 2		
		IC23	I - 1	Q23	K - 4	TP7	E - 2		
		IC24	L - 2	Q24	J - 1	TP8	F - 3		

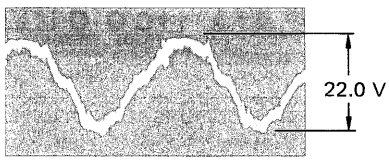
① **TP13**



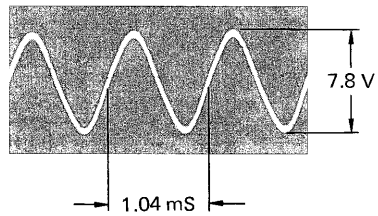
② **TP21**



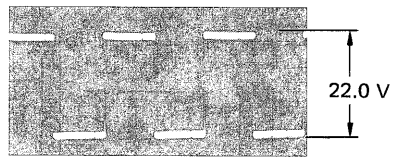
③ **TP19**



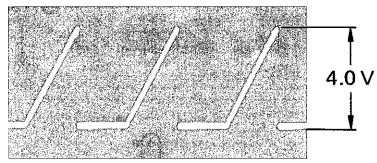
④ **CN6-1**



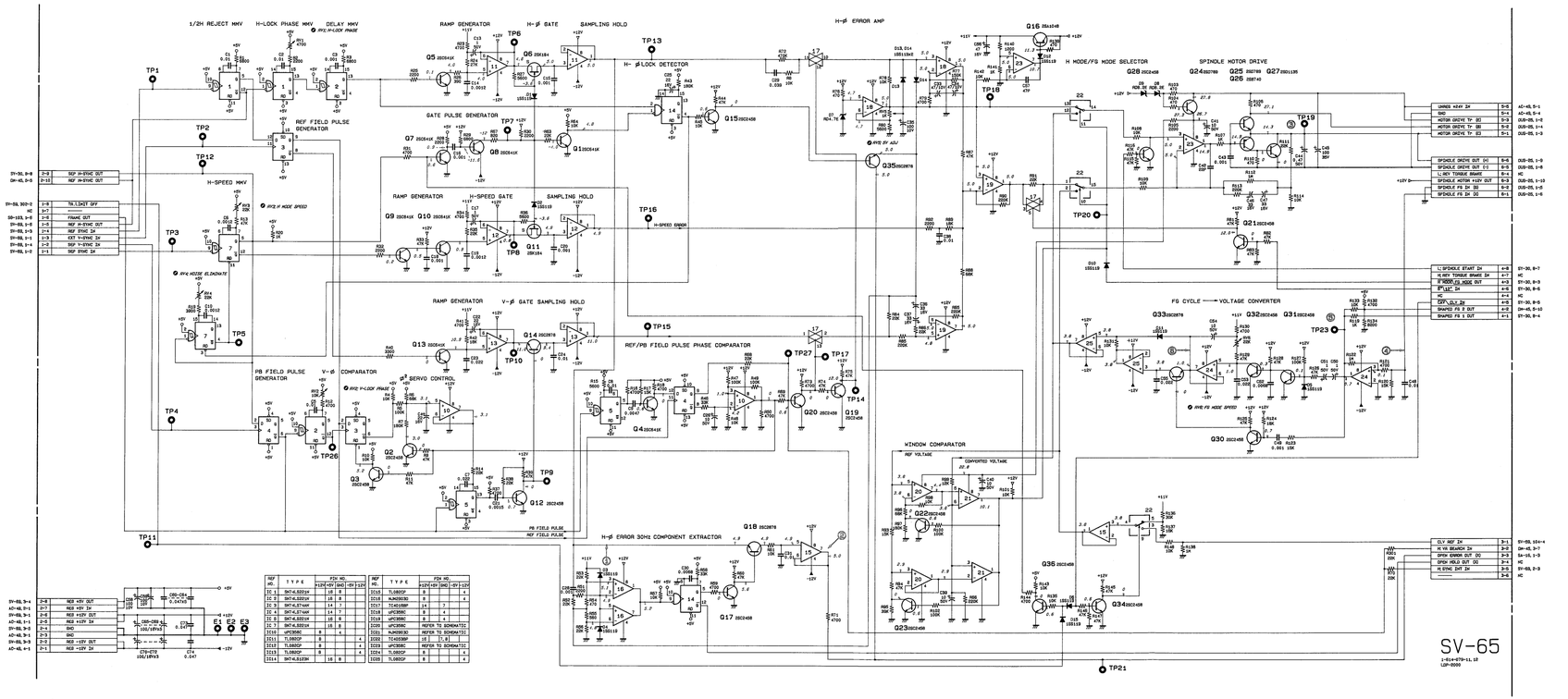
⑤ **TP23**

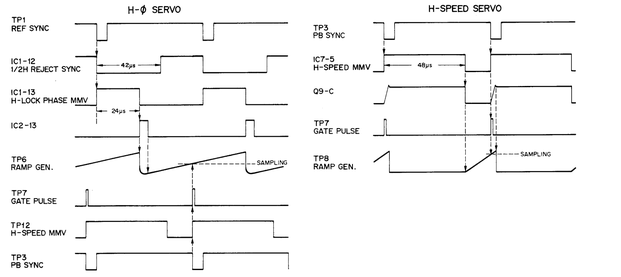


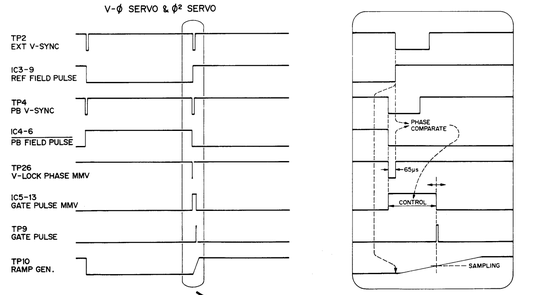
⑥ **IC 24-7**



SV-65 (SPINDLE SERVO)

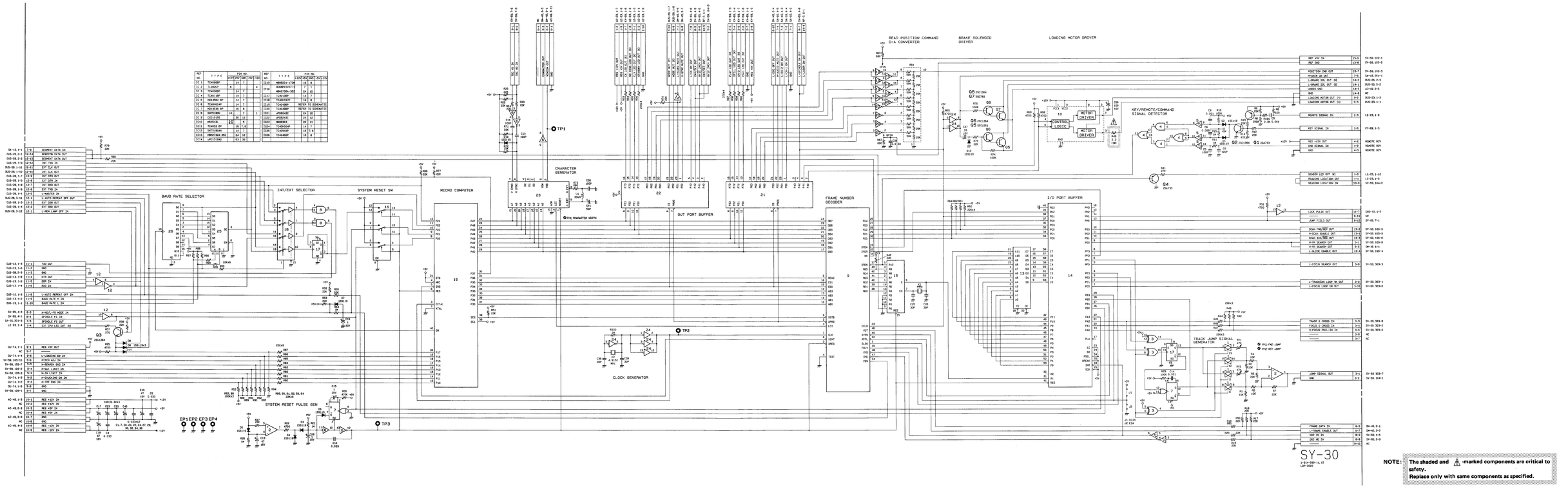






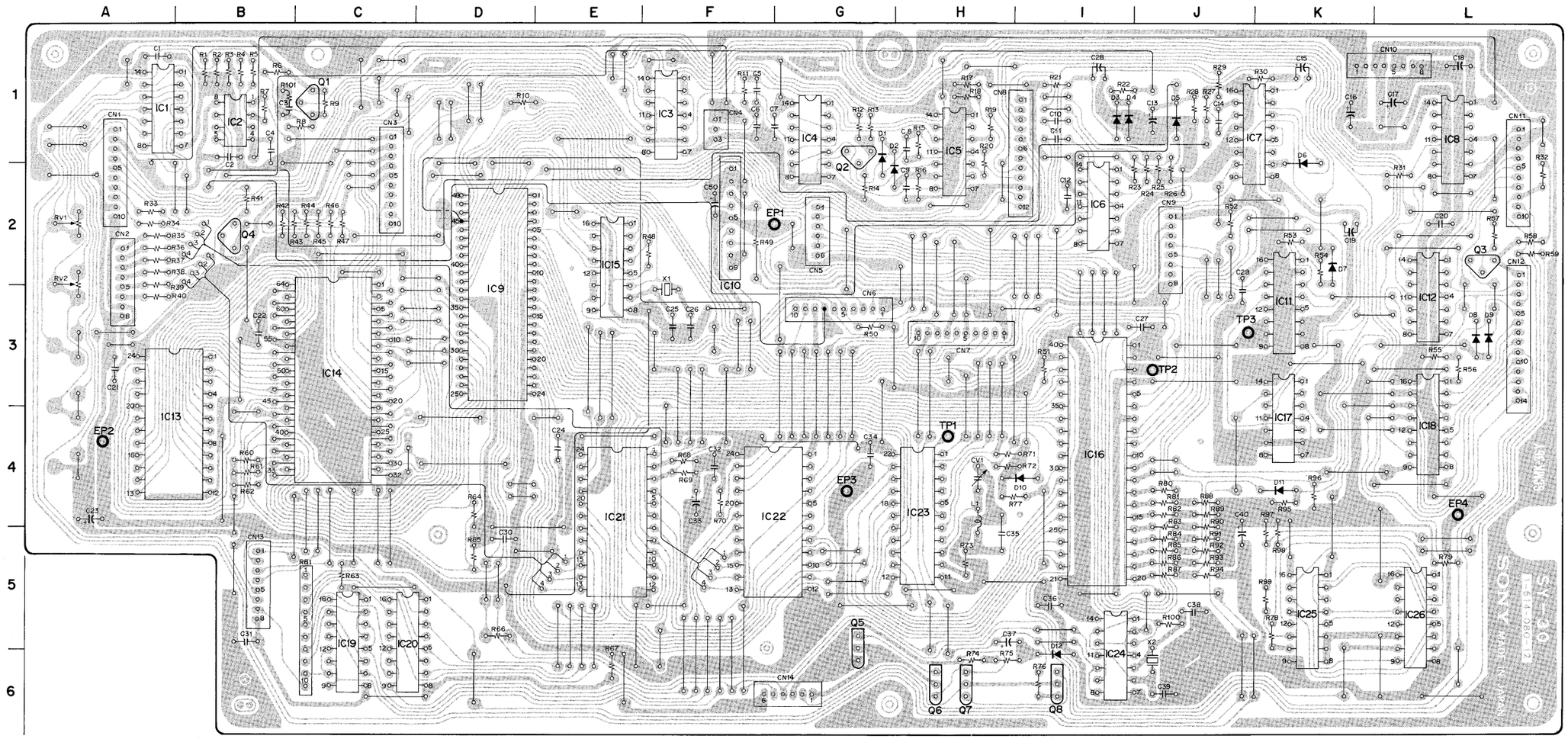
SY-30 SY-30

SY-30 (SYSTEM CONTROL)



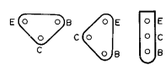
NOTE: The shaded and ⚠-marked components are critical to safety.
Replace only with same components as specified.

SY-30 (SYSTEM CONTROL)



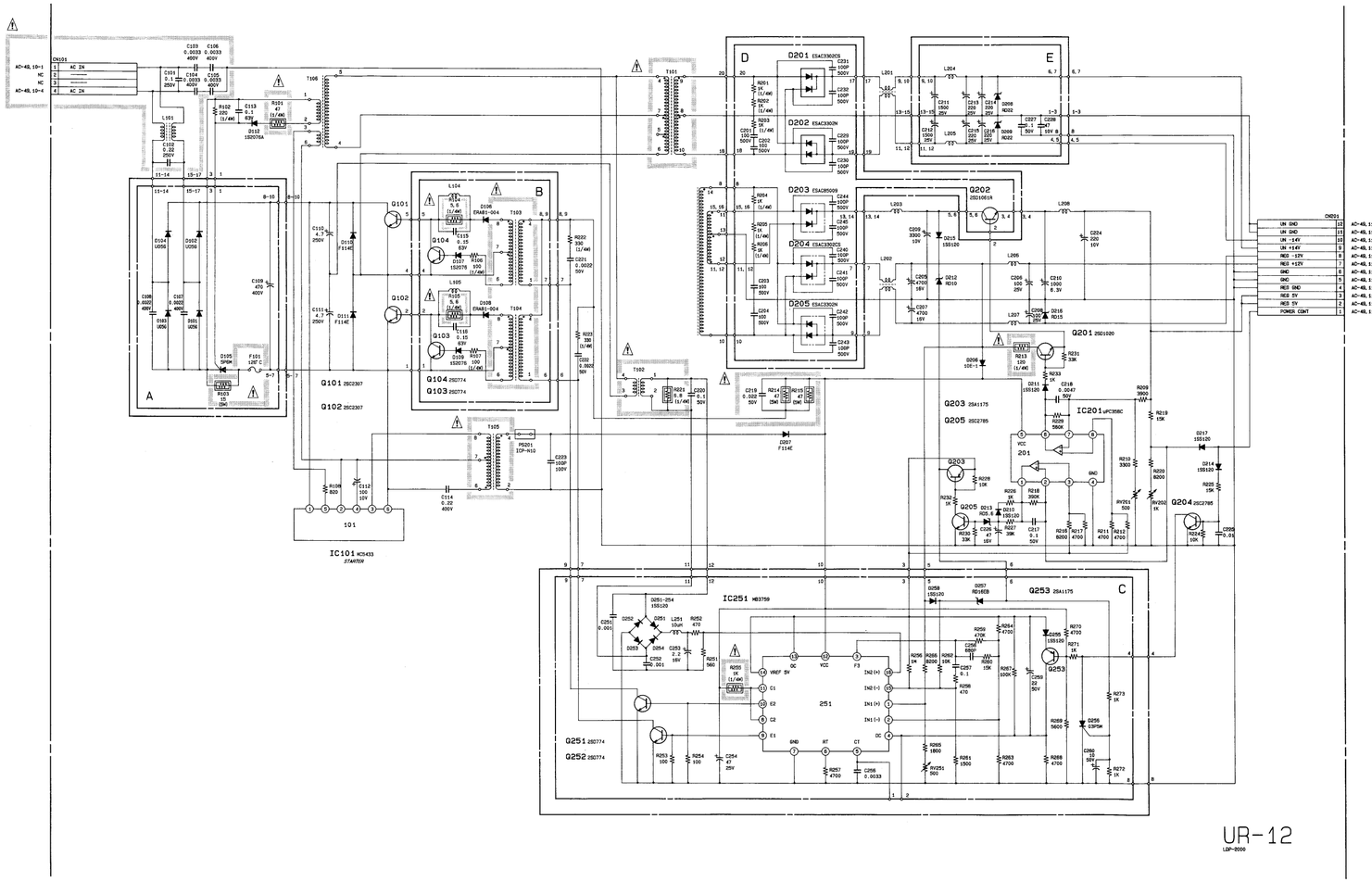
SY-30 —SOLDERING SIDE—

1-614-080-12
LDP-2000



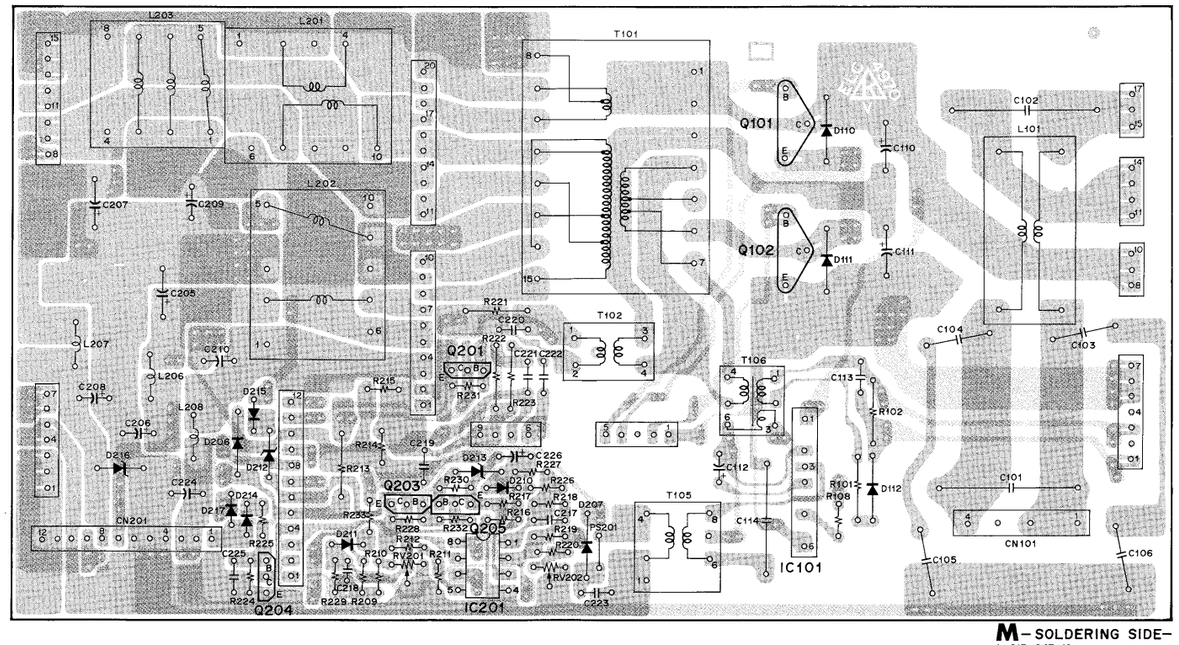
CN1	A - 1	Q1	C - 1
CN2	A - 2	Q2	G - 1
CN3	C - 2	Q3	L - 2
CN4	F - 1	Q4	B - 2
CN5	G - 2	Q5	G - 5
CN6	G - 3	Q6	H - 6
CN7	H - 3	Q7	H - 6
CN8	I - 1	Q8	I - 6
CN9	J - 2		
CN10	L - 1	RV1	A - 2
CN11	L - 1	RV2	A - 2
CN12	L - 1		
CN13	B - 5	TP1	H - 4
CN14	G - 6	TP2	J - 3
		TP3	J - 3
CV1	H - 4		
		X1	F - 2
D1	G - 1	X2	J - 6
D2	G - 1		
D3	I - 1		
D4	I - 1		
D5	J - 1		
D6	K - 1		
D7	K - 2		
D8	L - 3		
D9	L - 3		
D10	I - 4		
D11	K - 4		
D12	I - 6		
EP1	G - 2		
EP2	A - 4		
EP3	G - 4		
EP4	L - 4		
IC1	A - 1		
IC2	B - 1		
IC3	F - 1		
IC4	G - 1		
IC5	H - 1		
IC6	I - 2		
IC7	J - 1		
IC8	L - 1		
IC9	D - 2		
IC10	F - 2		
IC11	K - 3		
IC12	L - 3		
IC13	A - 4		
IC14	C - 3		
IC15	E - 2		
IC16	I - 4		
IC17	K - 4		
IC18	L - 4		
IC19	C - 5		
IC20	C - 5		
IC21	E - 4		
IC22	F - 4		
IC23	H - 4		
IC24	I - 5		
IC25	K - 5		
IC26	L - 5		

UR-12 (SWITCHING REGULATOR)

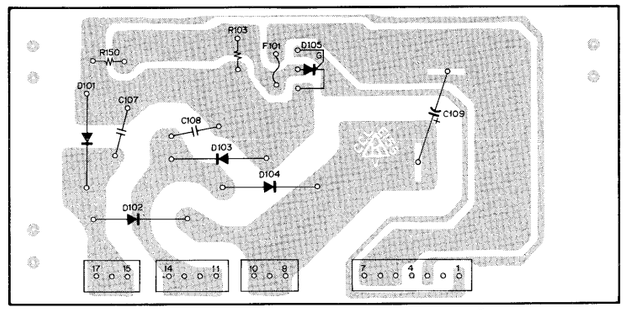


NOTE: **The shaded and ⚠-marked components are critical to safety.**
Replace only with same components as specified.

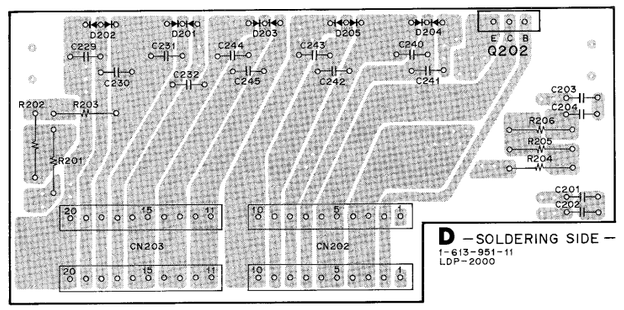
UR-12 (SWITCHING REGULATOR)



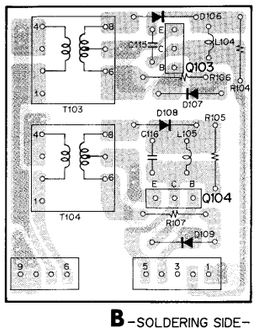
M – SOLDERING SIDE –
1-613-947-12
LDP-2000



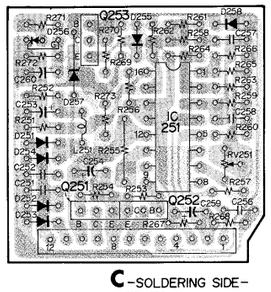
A – SOLDERING SIDE –
1-613-948-11
LDP-2000



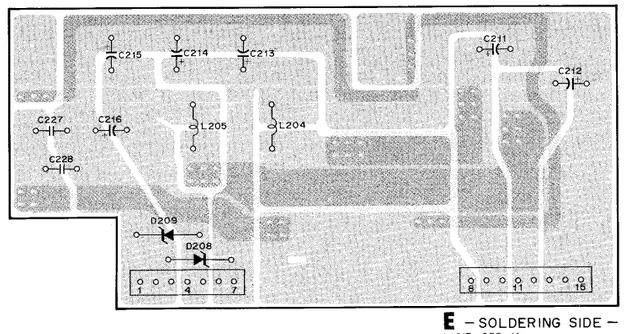
D – SOLDERING SIDE –
1-613-951-11
LDP-2000



B – SOLDERING SIDE –
1-613-949-11
LDP-2000

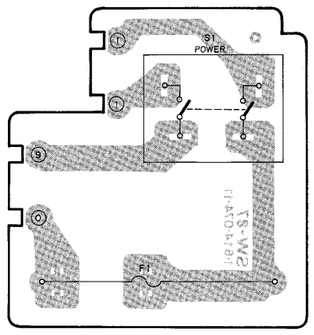


C – SOLDERING SIDE –
1-613-950-11
LDP-2000

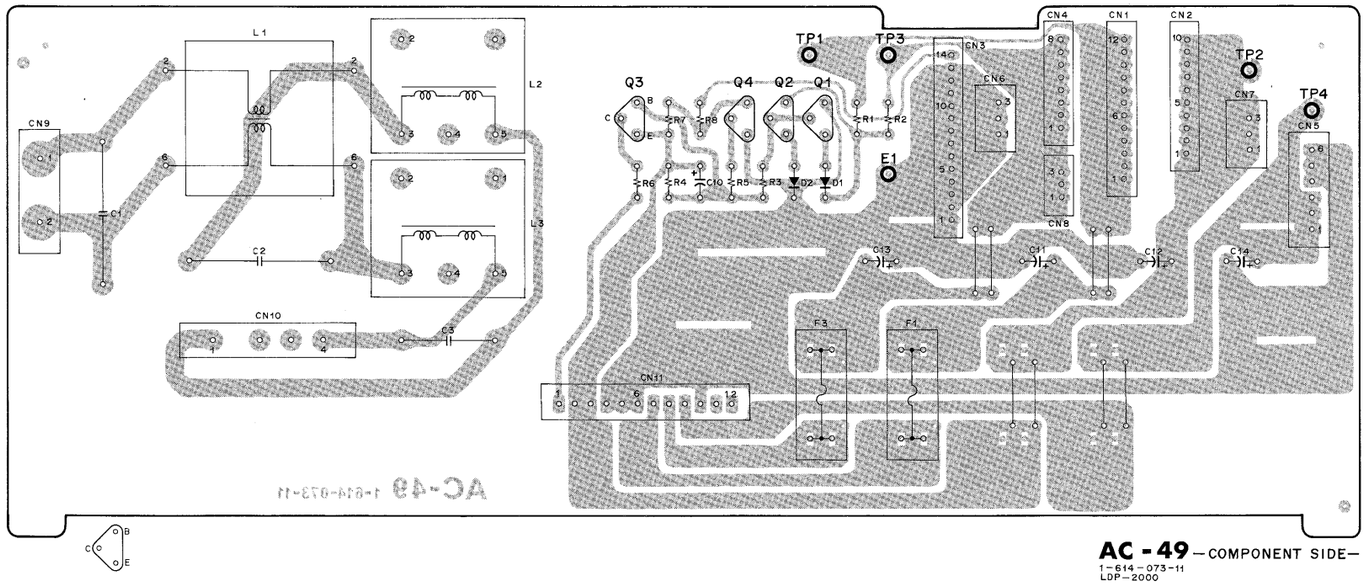


E – SOLDERING SIDE –
1-613-952-11
LDP-2000

AC-49 (AC LINE FILTER/DC POWER DISTRIBUTOR)
SW-87 (POWER SWITCH)

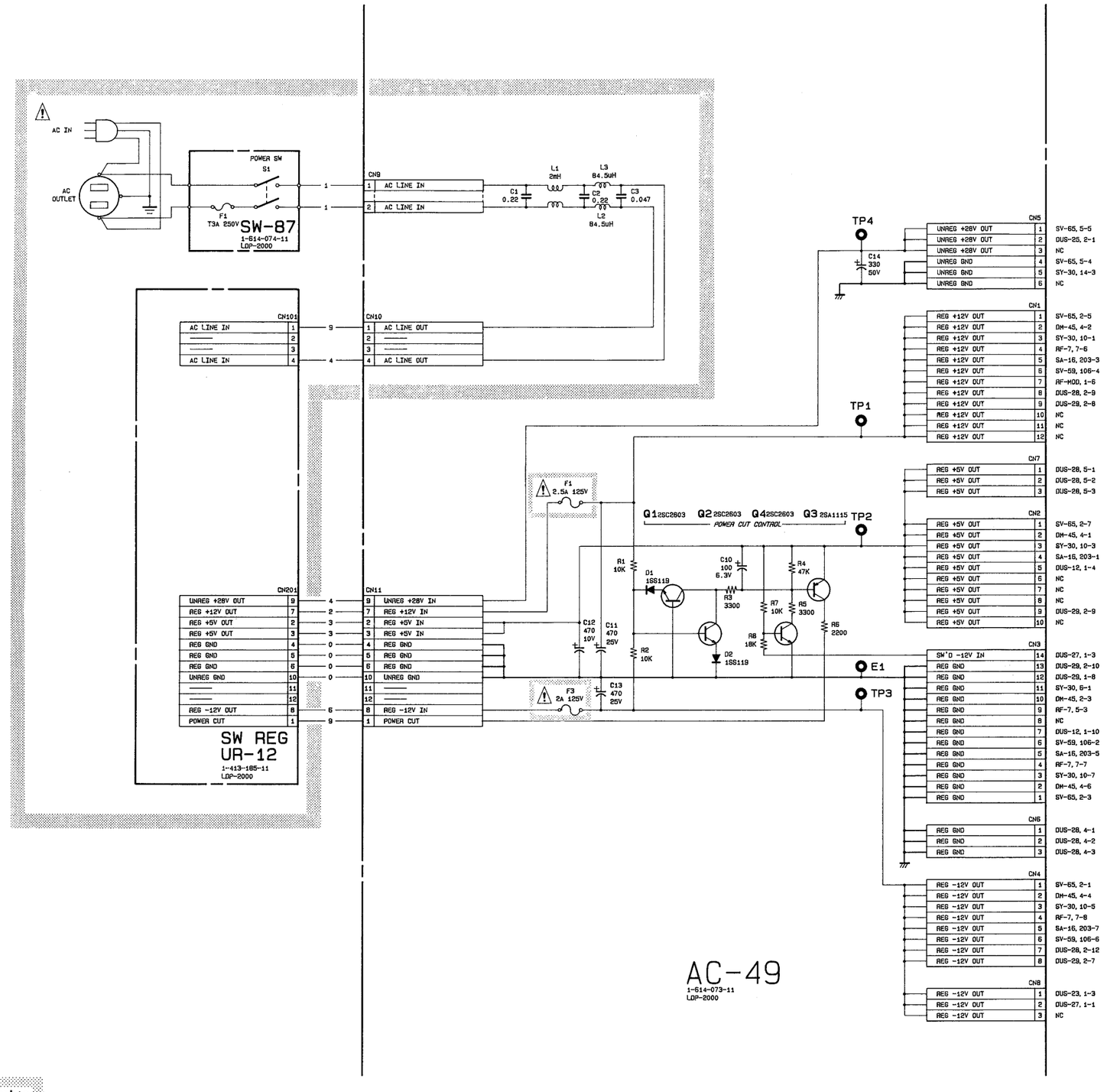


SW-87—COMPONENT SIDE—
1-614-074-11
LDP-2000



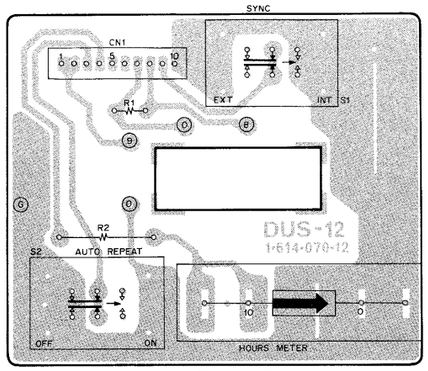
AC-49—COMPONENT SIDE—
1-614-073-11
LDP-2000

AC-49 (AC LINE FILTER/DC POWER DISTRIBUTOR)
SW-87 (POWER SWITCH)

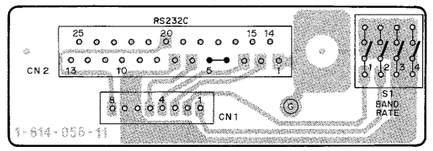


NOTE: **The shaded and ⚠ -marked components are critical to safety.**
Replace only with same components as specified.

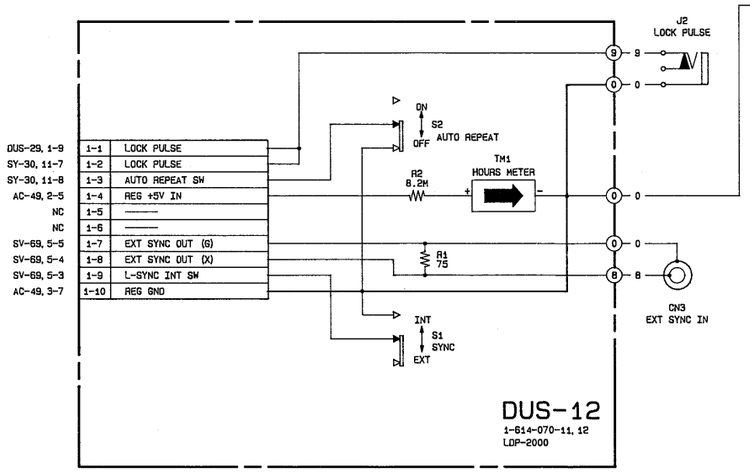
DUS-12 (CONNECTOR PANEL)
DUS-13

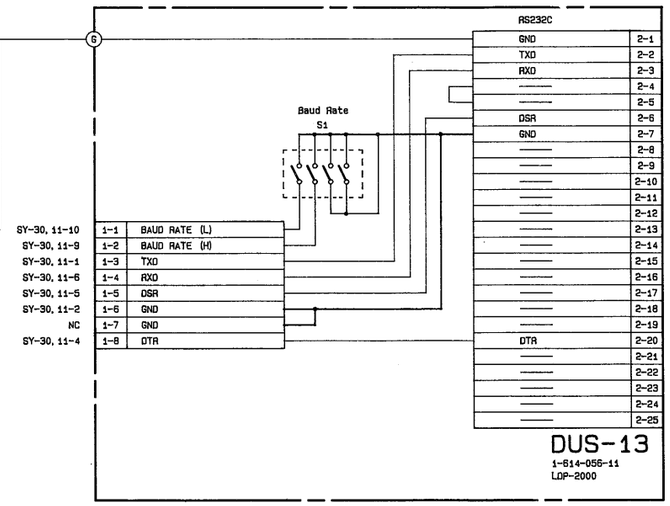


DUS-12 –SOLDERING SIDE–
1-614-070-12
LDP-2000

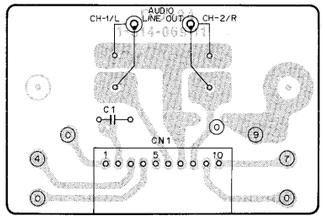


DUS-13– SOLDERING SIDE –
1-614-056-11
LDP-2000

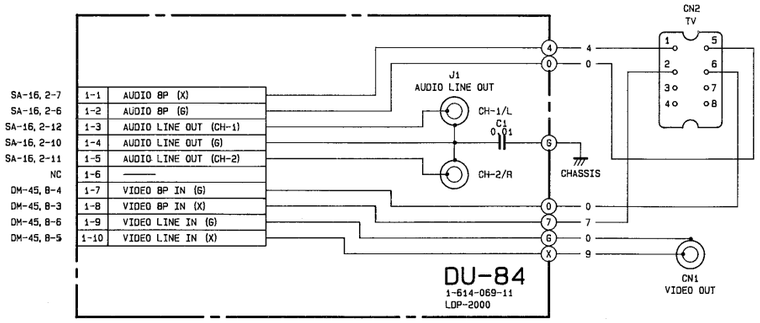


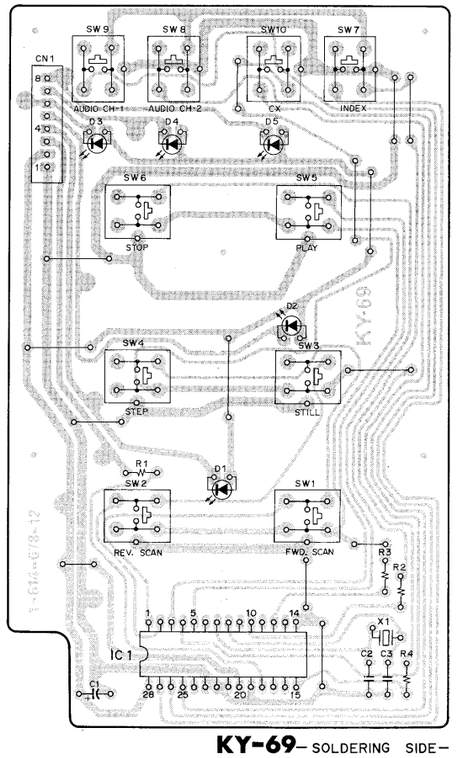


DU-84 (CONNECTOR PANEL)



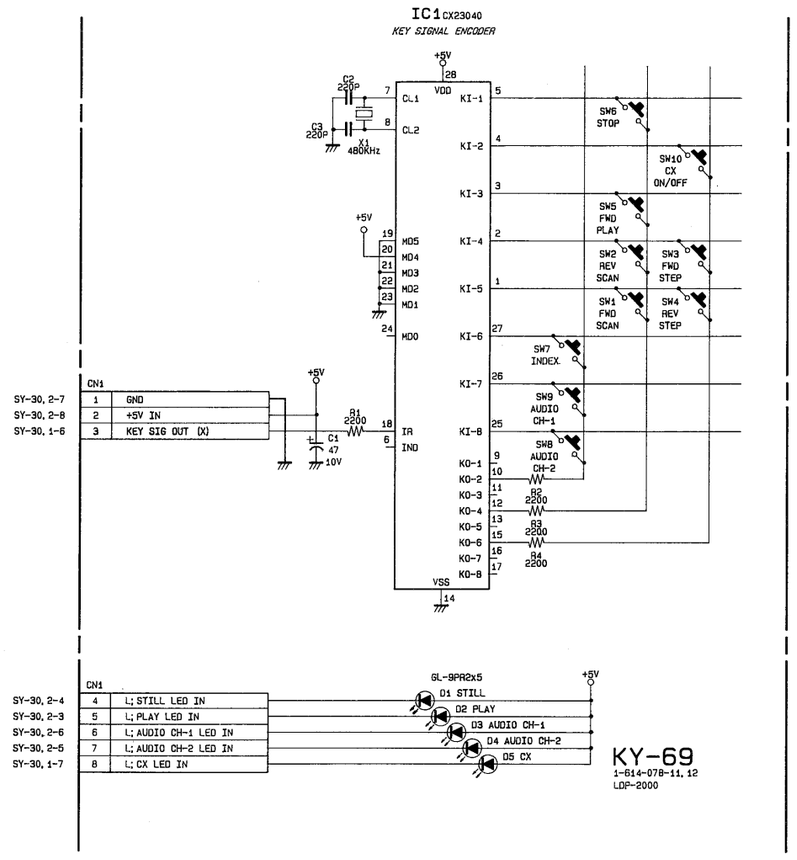
DU-84– COMPONENT SIDE –
1-614-069-11
LDP-2000



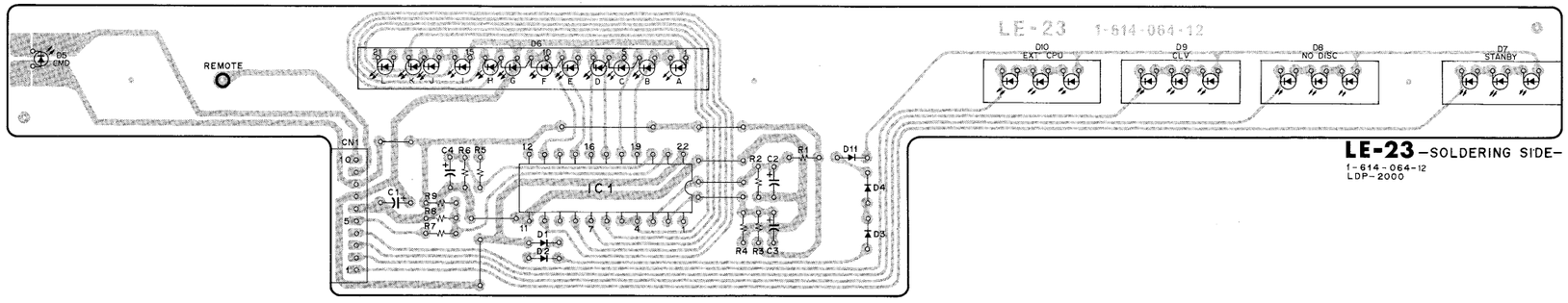


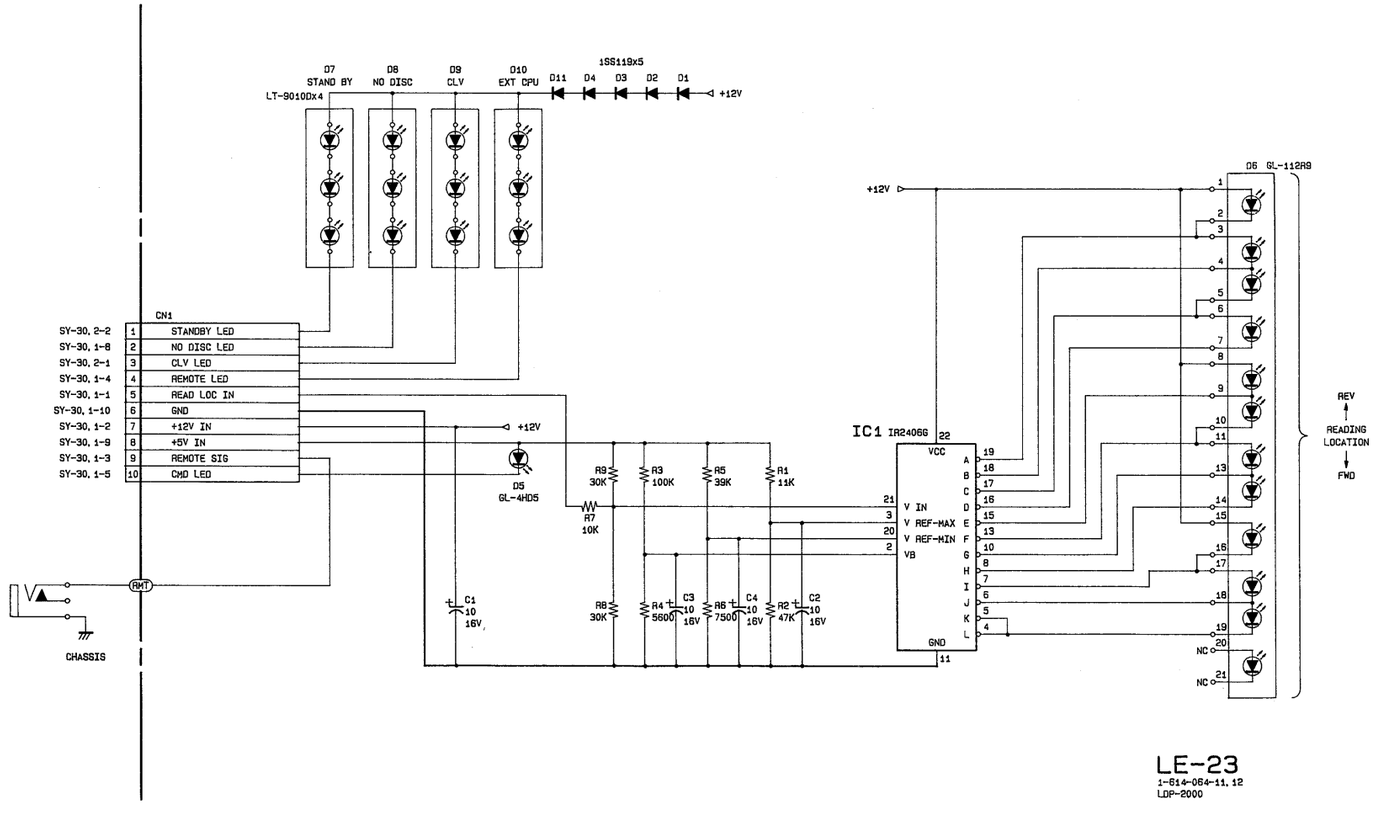
KY-69– SOLDERING SIDE –
1-614-078-12
LDP-2000

KY-69 (KEY SIGNAL ENCODER)

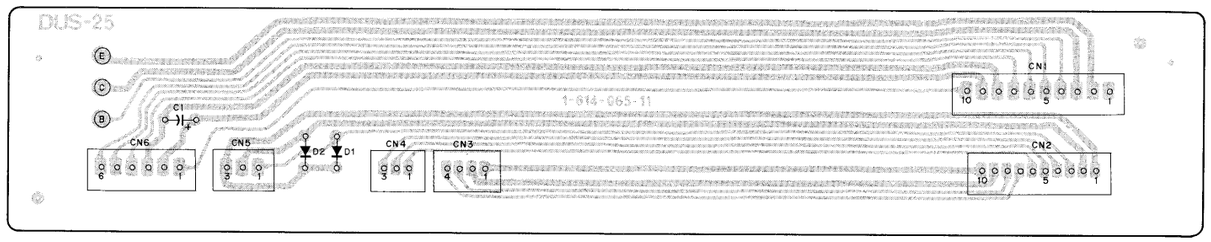


LE-23 (FRONT PANEL INDICATOR)

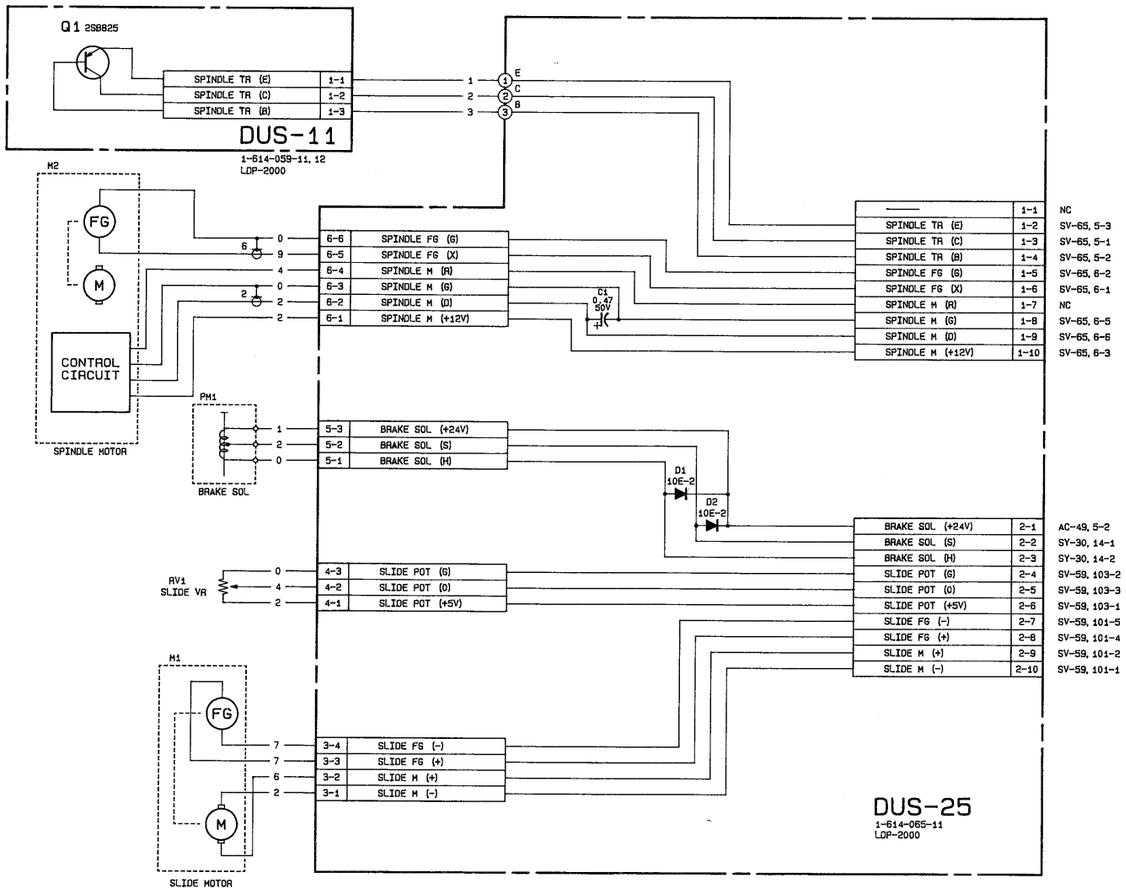


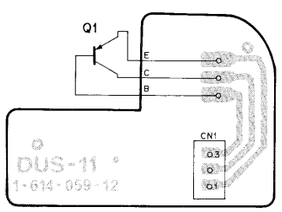


DUS-25 (SLED BASE)
DUS-11



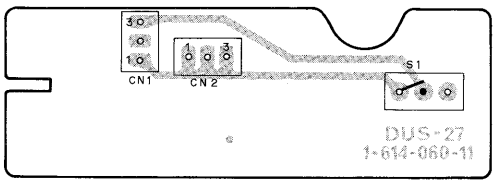
DUS-25 –SOLDERING SIDE–
1-614-065-11
LDP-2000



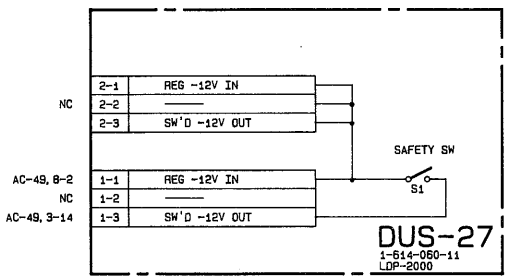


DUS-11 –SOLDERING SIDE–
1-614-059-12
LDP-2000

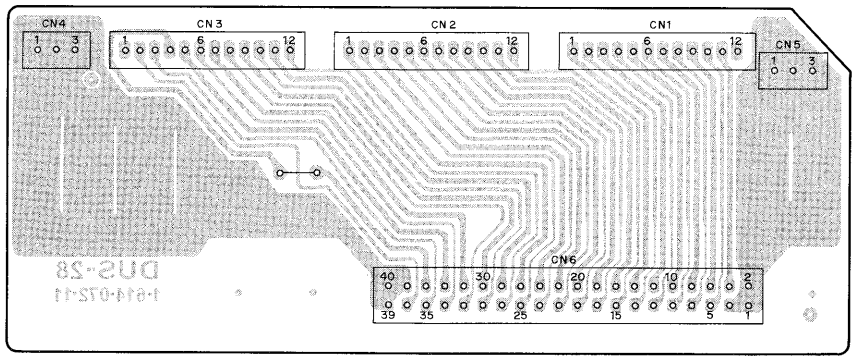
DUS-27 (SAFETY INTERLOCK SWITCH)



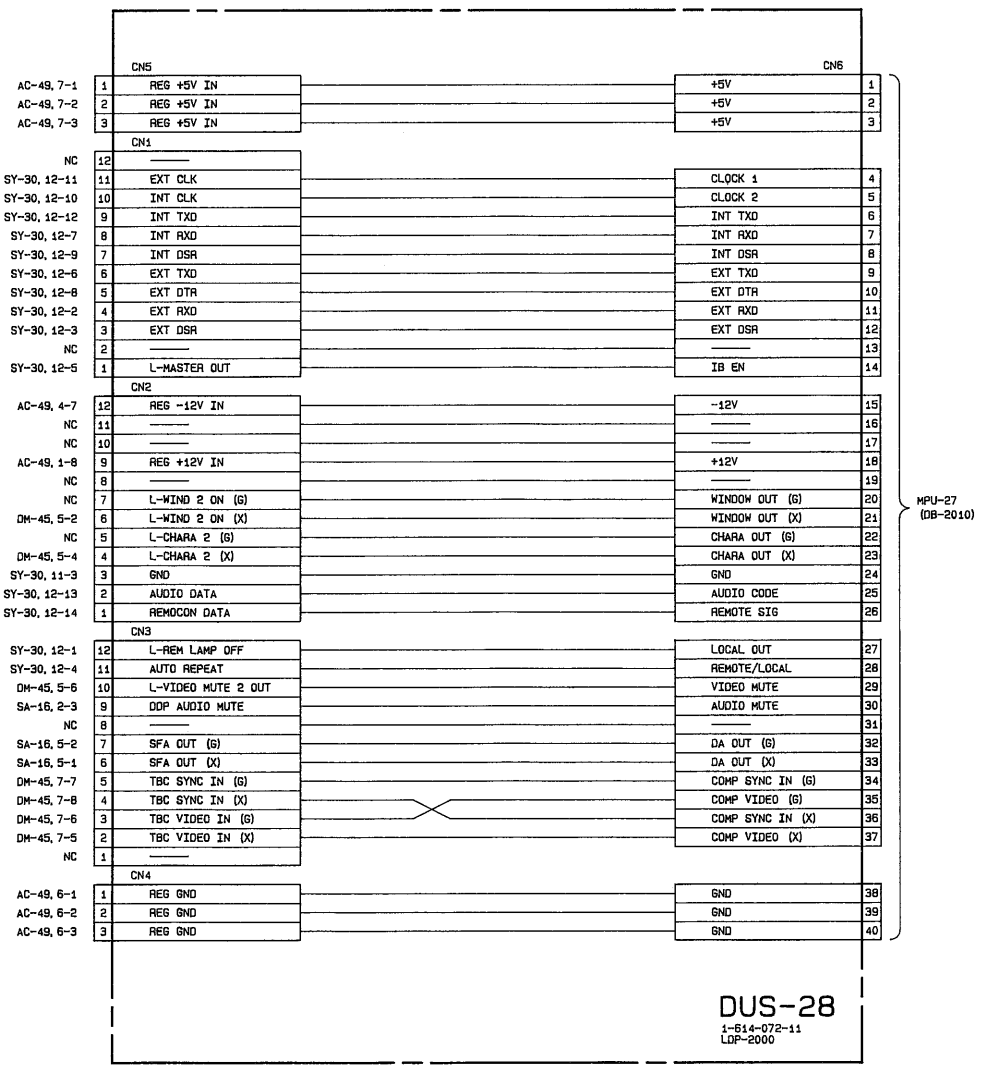
DUS-27–SOLDERING SIDE–
1-614-060-11
LDP-2000



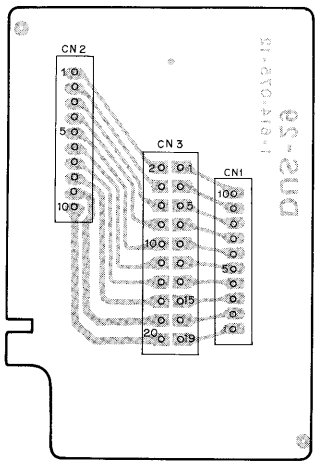
DUS-28 (OPTION BOARD CONNECTOR)



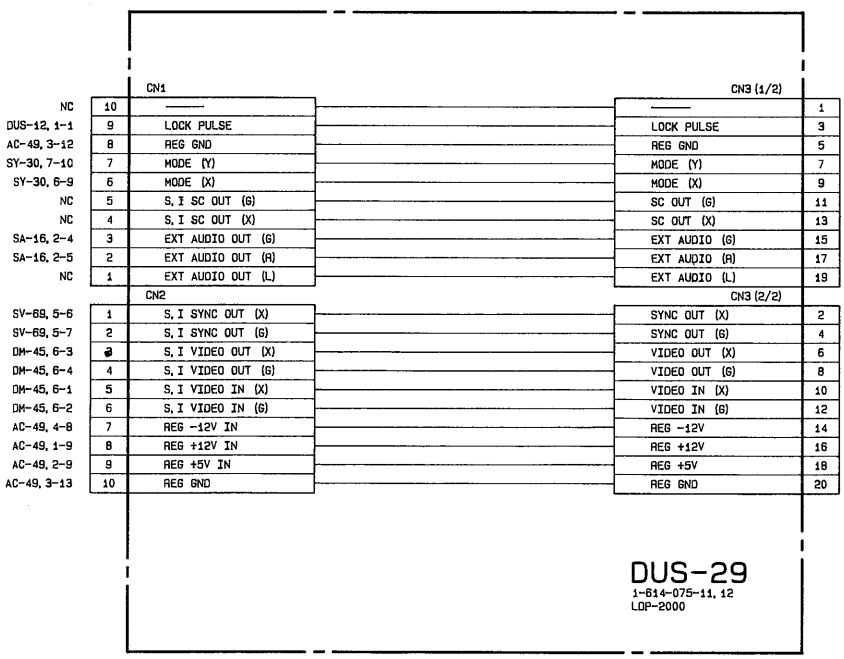
DUS-28 – COMPONENT SIDE –
1-614-072-11
LDP-2000



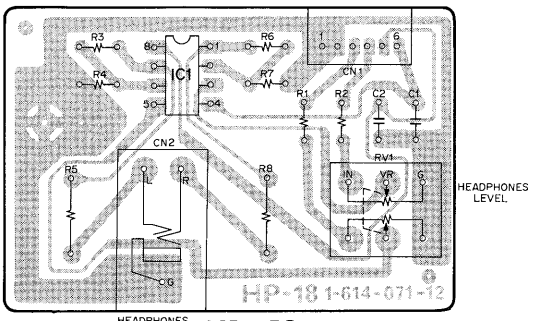
DUS-29 (OPTION BOARD CONNECTOR)



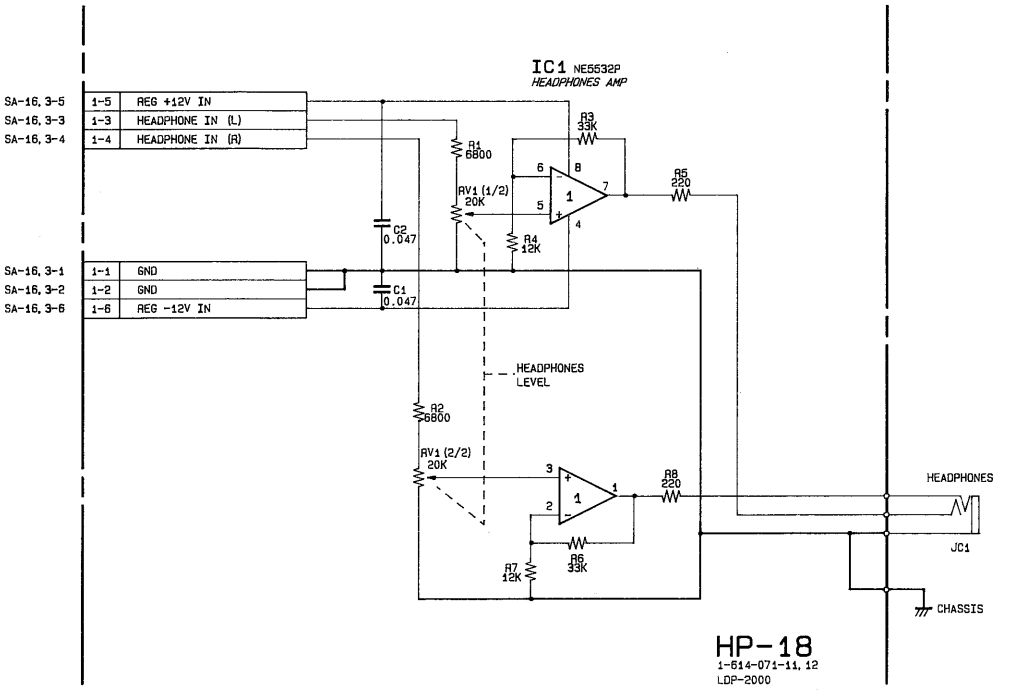
DUS-29–COMPONENT SIDE–
1-614-075-12
LDP-2000


CN1
NC 10 ——
DUS-12, 1-1 9 LOCK PULSE
AC-49, 3-12 8 REG GND
SY-30, 7-10 7 MODE (Y)
SY-30, 6-9 6 MODE (X)
NC 5 S, I SC OUT (G)
NC 4 S, I SC OUT (X)
SA-16, 2-4 3 EXT AUDIO OUT (G)
SA-16, 2-5 2 EXT AUDIO OUT (R)
NC 1 EXT AUDIO OUT (L)
CN2
SY-69, 5-6 1 S, I SYNC OUT (X)
SY-69, 5-7 2 S, I SYNC OUT (G)
DM-45, 6-3 3 S, I VIDEO OUT (X)
DM-45, 6-4 4 S, I VIDEO OUT (G)
DM-45, 6-1 5 S, I VIDEO IN (X)
DM-45, 6-2 6 S, I VIDEO IN (G)
AC-49, 4-8 7 REG -12V IN
AC-49, 1-9 8 REG +12V IN
AC-49, 2-9 9 REG +5V IN
AC-49, 3-13 10 REG GND
CN3 (1/2)
—— 1
LOCK PULSE 3
REG GND 5
MODE (Y) 7
MODE (X) 9
SC OUT (G) 11
SC OUT (X) 13
EXT AUDIO (G) 15
EXT AUDIO (R) 17
EXT AUDIO (L) 19
CN3 (2/2)
SYNC OUT (X) 2
SYNC OUT (G) 4
VIDEO OUT (X) 6
VIDEO OUT (G) 8
VIDEO IN (X) 10
VIDEO IN (G) 12
REG -12V 14
REG +12V 16
REG +5V 18
REG GND 20
DUS-29
1-614-075-11, 12
LDP-2000

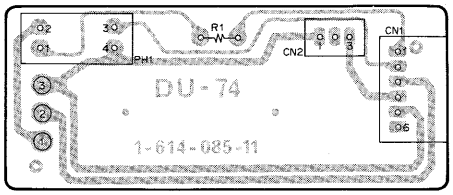
HP-18 (HEADPHONES AMP)



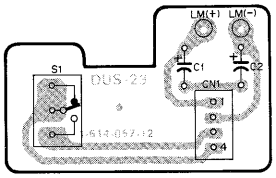
HP-18 -SOLDERING SIDE-
1-614-071-12
LDP-2000



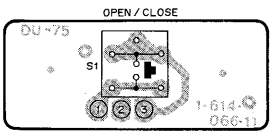
DU-74 (FRONT LOADING)
DU-75
DU-82
DUS-23



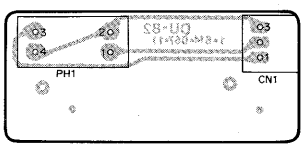
DU-74 -SOLDERING SIDE-
1-614-085-11
LDP-2000



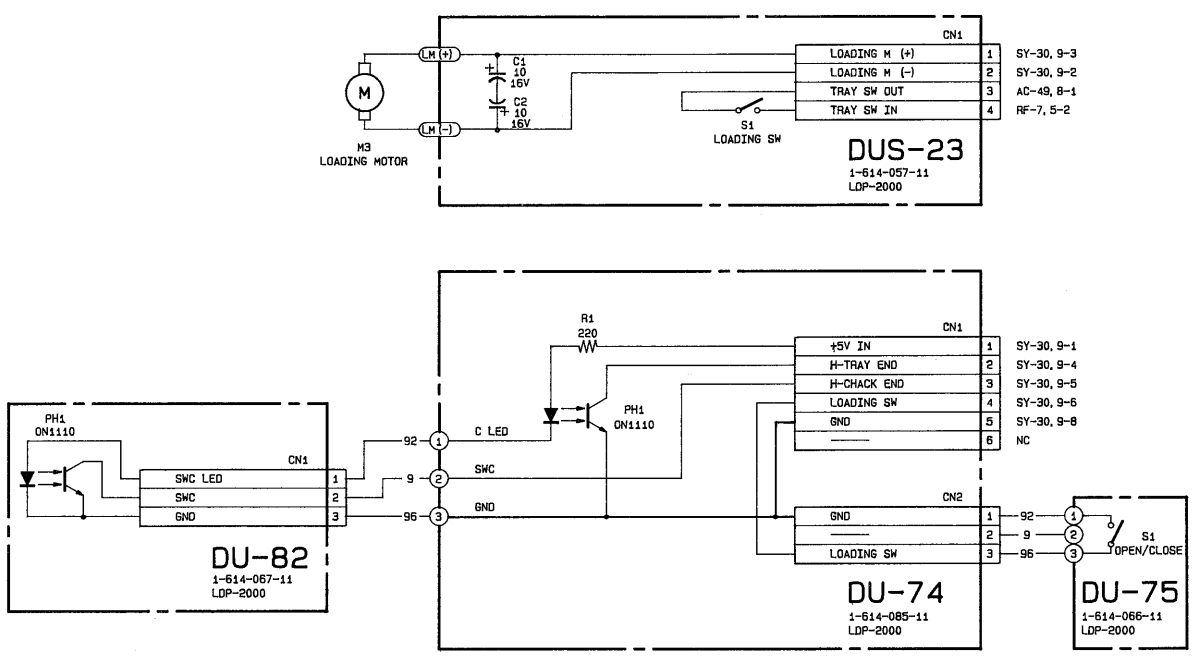
DUS-23
-SOLDERING SIDE-
1-614-057-12
LDP-2000



DU-75 -SOLDERING SIDE-
1-614-066-11
LDP-2000



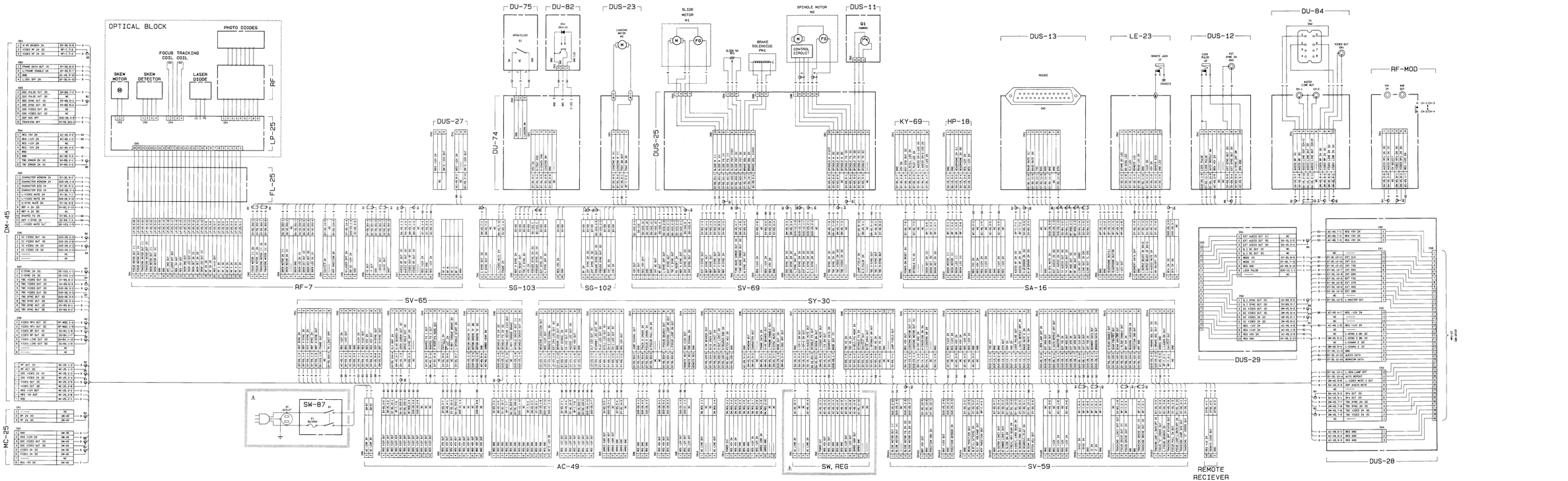
DU-82 -COMPONENT SIDE-
1-614-067-11
LDP-2000


CN1
LOADING M (+) 1 SY-30, 9-3
LOADING M (-) 2 SY-30, 9-2
TRAY SW OUT 3 AC-49, 8-1
TRAY SW IN 4 RF-7, 5-2
LM (+)
LM (-)
C1 10 16V
C2 10 16V
M
M3 LOADING MOTOR
S1 LOADING SW
DUS-23
1-614-057-11
LDP-2000
R1 220
PH1 ON1110
+5V IN 1 SY-30, 9-1
H-TRAY END 2 SY-30, 9-4
H-CHACK END 3 SY-30, 9-5
LOADING SW 4 SY-30, 9-6
GND 5 SY-30, 9-8
6 NC
CN2
GND 1 92
2 9
LOADING SW 3 96
C LED
SWC
GND
SWC LED 1
SWC 2
GND 3
DU-82
1-614-067-11
LDP-2000
DU-74
1-614-085-11
LDP-2000
S1 OPEN/CLOSE
DU-75
1-614-066-11
LDP-2000

FRAME FRAME

FRAME FRAME

FRAME WIRING



NOTE: The shaded and ⚠ -marked components are critical to safety.
Replace only with same components as specified.

SECTION 8
SPARE PARTS AND FIXTURE

8-1. PARTS INFORMATION

1. Safety Related Component Warning
   Components identified by shading marked with ⚠ on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose parts numbers appear as shown in this manual or in service bulletins and service manual supplements published by Sony.
2. Replacement Parts supplied from Sony Parts Center will sometimes have different shape and outside view from the parts which actually in use. This is due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts."
   - This manual's exploded views and electrical spare parts lists are indicating the parts numbers of "the standardized genuine parts at present".
   - Regarding engineering parts changes in our engineering department, refer Sony service bulletins and service manual supplements.
3. The parts as shown "S" in SP space on the exploded views and electrical spare parts list are normally stocked for replacement purposes. The parts as shown "O" in SP space are not normally required for routine service work. Ordres for parts as shown "O" will be processed, but allow for additional delivery time.
4. Item with no part number and/or no description are not stocked because they are seldom required for routine service.

8-2. EXPLODED VIEW

- **Exploded views are composed of the following blocks.**

(1) Ornamental Panel
Front, right, left, upper and bottom sides

(2) Front Loading

(3) Chassis (1)
Left side chassis

(4) Chassis (2)
Right side chassis

(5) Connector Panel

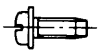
(6) Chuck Ass'y
Disc chuck

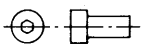
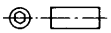
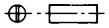
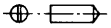
(7) Sled Base (1)
Spindle motor

(8) Sled Base (2)
Optical block ass'y

- **Fixing Screw, Stop Ring and Others**

The screws used in this machine are the TOTSU type, Phillips type (⊕) and slotted type (⊖) screws.
The screws are interchangeable with these type screws.
The TOTSU type screws are listed as follows.

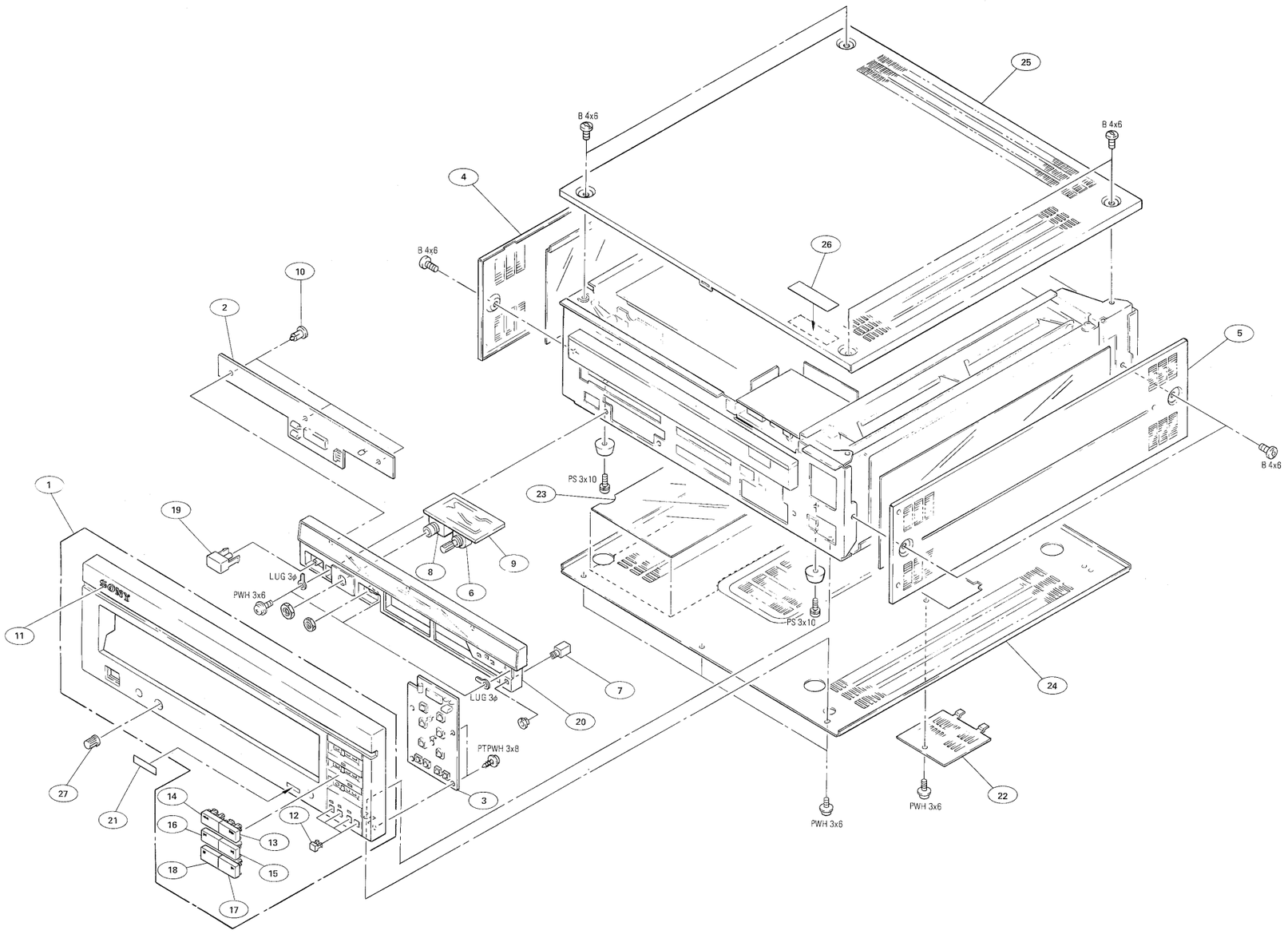
	PS	PSW	B (BZn N)	B (Cr-N)	PTT	PTTWH
						
2.6 x 4	7-621-972-05	———	7-621-912-10	7-621-912-18	———	———
2.6 x 6	7-621-972-25	7-621-981-15	7-621-912-30	7-621-912-38	———	———
2.6 x 8	7-621-972-35	7-621-981-25	7-621-912-40	7-621-912-48	———	———
3 x 5	7-686-446-01	———	———	———	———	
3 x 6	7-686-447-01	7-686-527-01	7-686-624-09	7-686-624-04	7-687-411-31	7-687-510-31
3 x 8	7-686-448-01	7-686-528-01	7-686-625-09	7-686-625-04	7-687-412-31	7-687-511-31
3 x 10	7-686-449-01	7-686-529-01	7-686-626-09	7-686-626-04	7-687-413-31	7-687-512-31
3 x 12	7-686-450-01	7-686-530-01	7-686-627-09	7-686-627-04	7-687-414-31	7-687-513-31
3 x 16	7-686-452-01	7-686-532-01	7-686-629-09	7-686-629-04	———	———
3 x 20	7-686-453-01	7-686-533-01	7-686-630-09	7-686-630-04	———	———
3 x 25	7-686-454-01	7-686-534-01	7-686-631-09	7-686-631-04		
4 x 8	7-686-468-01	7-686-548-01	7-686-635-09	7-686-635-04	———	———
4 x 12	7-686-470-01	7-686-550-01	7-686-637-09	7-686-637-04	———	———
4 x 14	7-686-471-01	———	7-686-638-09	7-686-638-04	———	———
4 x 16	7-686-472-01	———	7-686-639-09	7-686-639-04	———	———
4 x 20	7-686-473-01	———	7-686-640-09	7-686-640-04	———	———

	HEXAGON SOCKET SCREW 	HEXAGON SET SCREW 	(–) SET SCREW FLAT POINT 	(–) SET SCREW CONE POINT 
2.6 x 3	———	7-621-734-09	———	———
2.6 x 4	7-621-996-24	7-621-735-09	———	———
2.6 x 5	———	7-621-736-09	———	———
2.6 x 6	7-683-412-05	———	———	7-621-712-55
2.6 x8	7-683-413-05	———	———	7-621-712-65
2.6 x 10	———	———	———	7-621-712-75
3 x 5	———	———	7-683-175-01	———
3 x 6	7-683-403-04	———	7-683-176-01	7-683-176-21
3 x 8	7-683-404-04	———	———	7-683-177-21
3 x 10	7-683-405-04	———	———	7-683-178-21

	FLAT WASHER SMALL W.	FLAT WASHER MIDDLE W.	SPRING WASHER SW.	TOOTHED WASHER TYPE B LW.	HEXAGON NUT N.
2.6 mm	7-688-002-01	7-688-002-12	7-623-207-22	7-623-421-07	7-622-207-05
3 mm	7-688-003-01	7-688-003-12	7-688-003-11	7-623-422-07	7-684-023-04
4 mm	7-688-004-01	7-688-004-12	7-623-210-22	7-623-423-07	7-684-024-04
5 mm	7-688-005-01	7-688-005-01	7-623-212-22	———	7-684-025-04

	STOP RING E TYPE E.
2	7-624-104-04
2.3	7-624-105-04
3	7-624-106-04
4	7-624-108-04
5	7-624-109-04
6	7-624-110-04

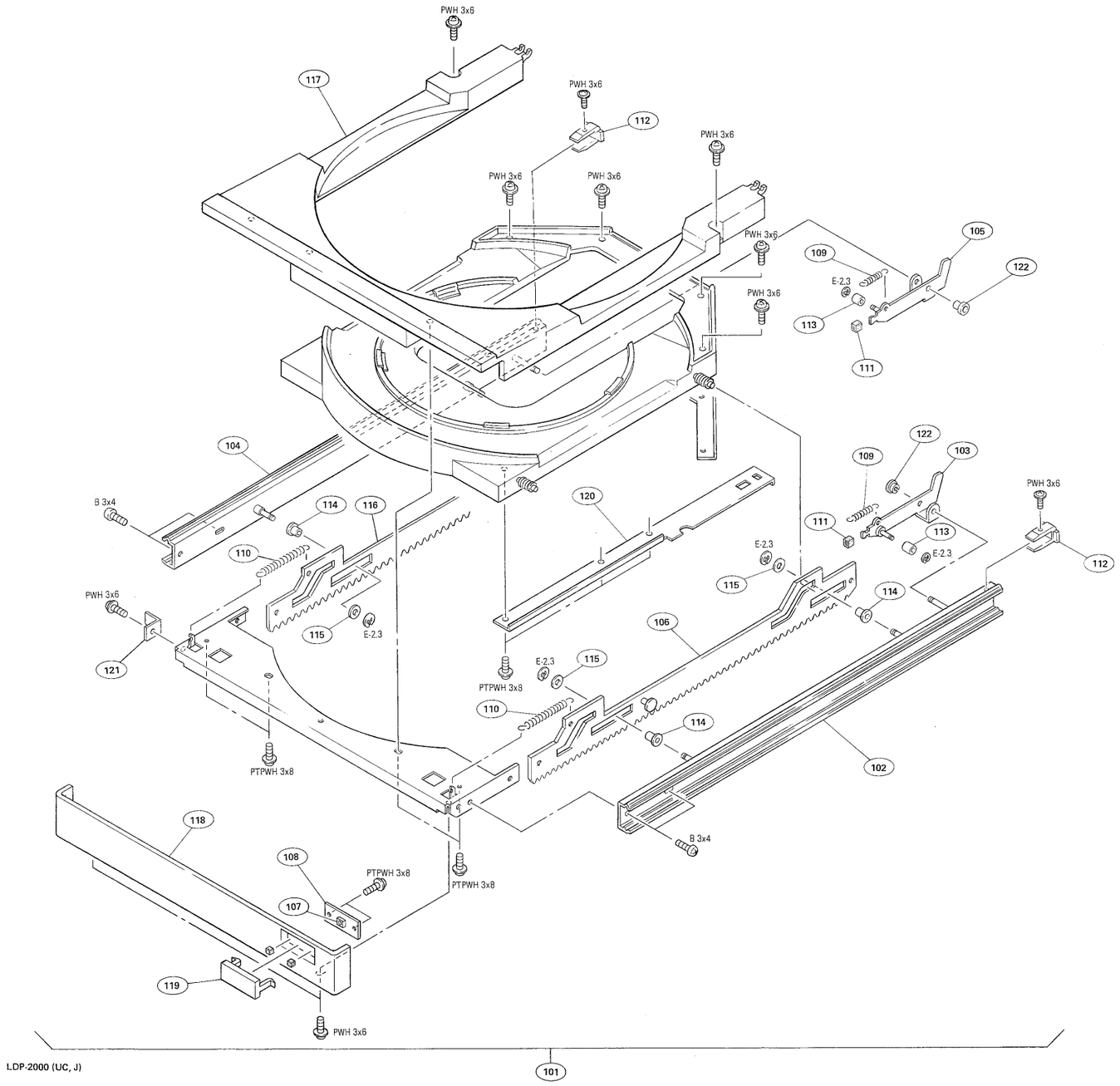
Ornamental Panel



No.	Parts No.	SP	Description
⚠1	A−6408−030−A	o	PANEL ASSY, FRONT
2	A−6421−034−A	o	MOUNTED CIRCUIT BOARD, LE-23
3	A−6421−047−A	o	MOUNTED CIRCUIT BOARD, KY-69
⚠4	X−3688−230−2	o	PANEL ASSY (LEFT), SIDE
⚠5	X−3688−231−2	o	PANEL ASSY (RIGHT), SIDE
6	1−226−439−00	s	RES, VAR, CARBON 20K "HEADPHONES LEVEL"
7	1−507−195−21	s	SPECIAL REMOTE CONTROL JACK
8	1−507−553−00	s	JACK "HEADPHONES"
9	1−614−071−12	o	PC BOARD, HP-18
10	3−646−090−11	s	RIVET, NYLON
11	3−668−914−11	o	EMBLEM, SONY
12	3−688−288−01	s	BUTTON, AU
13	3−688−289−01	s	KEY TOP (S) "FWD"
14	3−688−289−11	s	KEY TOP (S) "REV"
15	3−688−289−21	s	KEY TOP (S) "STILL"
16	3−688−289−31	s	KEY TOP (S) "STEP"
17	3−688−290−01	s	KEY TOP (L) "PLAY"
18	3−688−290−11	s	KEY TOP (L) "STOP"
19	3−688−293−01	s	BUTTON, POWER
20	3−688−294−02	o	HOLDER, INDICATOR
21	3−688−304−01	o	LABEL, MODEL NAME
22	3−688−328−01	o	WINDOW, REPLACEMENT
23	3−688−329−01	o	SHEET, INSULATOR
24	3−688−330−01	o	PLATE, BOTTOM
⚠25	3−688−339−01	o	PANEL, UPPER
26	4−884−503−01	o	LABEL, CAUTION, LASER
27	4−902−067−11	s	KNOB, CONTROL "HEADPHONES LEVEL"

The shaded and ⚠ -marked components are critical to safety.
Replace only with same components as specified.

Front Loading

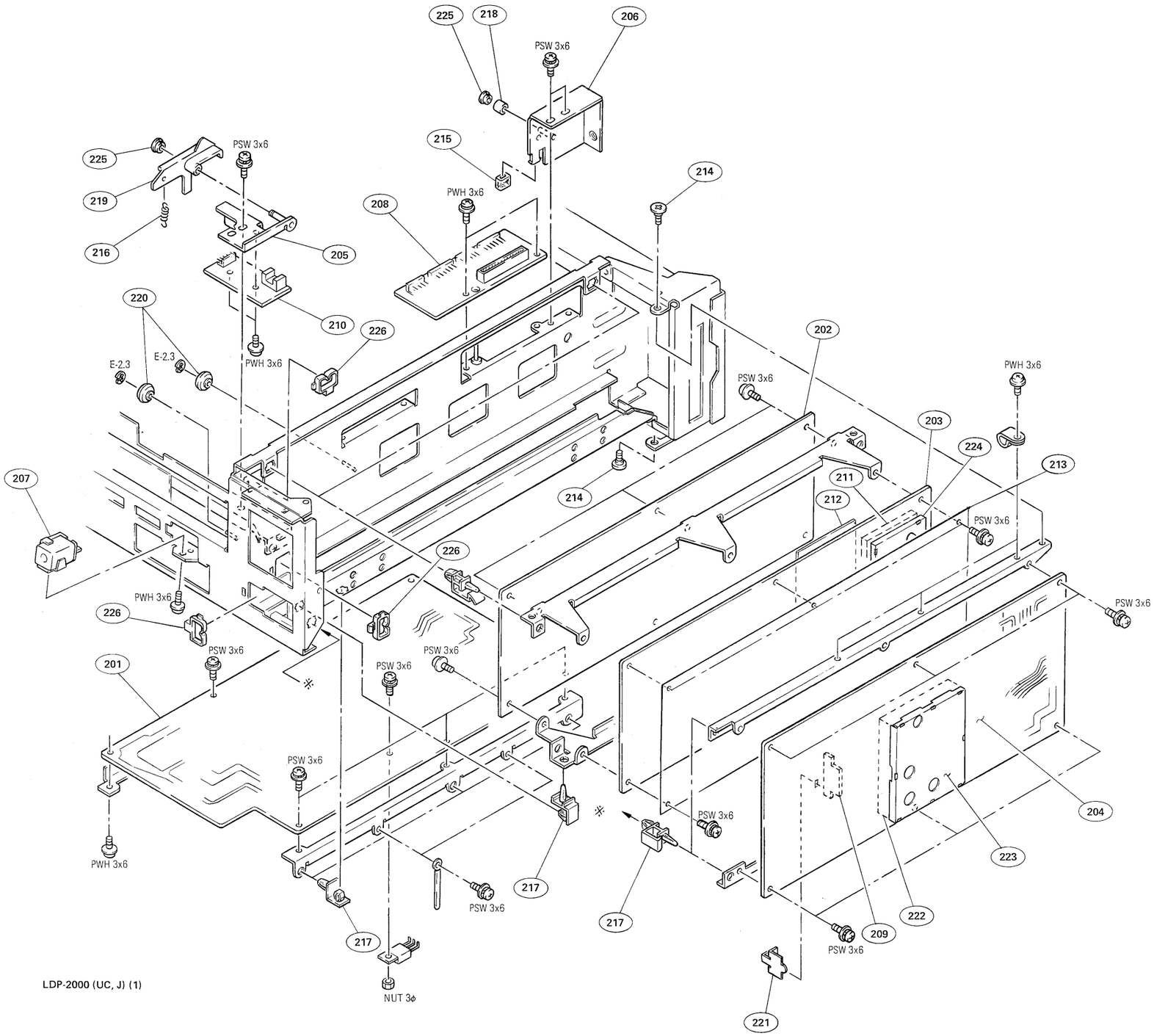


LDP-2000 (UC, J)

No.	Parts No.	SP	Description
⚠ 101	A−6415−053−A	s	F.L. ASSY
⚠ 102	X−3688−202−2	o	RAIL (RIGHT) ASSY, GUIDE
103	X−3688−203−2	o	ARM (RIGHT) ASSY, LOCK
⚠ 104	X−3688−204−1	o	RAIL (LEFT) ASSY, GUIDE
105	X−3688−205−1	o	ARM (LEFT) ASSY, LOCK
106	X−3688−207−1	o	RACK ASSY
107	1−554−936−11	s	SWITCH, KEY "OPEN/CLOSE"
108	1−614−066−11	o	PC BOARD, DU-75
109	3−535−558−11	s	SPRING, TENSION
110	3−642−429−11	s	SPRING, TENSION
111	3−676−143−00	o	STOPPER, ARM
112	3−688−203−03	s	STOPPER
113	3−688−207−01	s	ROLLER, STOPPER
114	3−688−208−01	s	ROLLER (R1)
115	3−688−209−01	s	ROLLER (R2)
116	3−688−210−01	o	RACK
⚠ 117	3−688−213−01	o	COVER, TOP
⚠ 118	3−688−214−01	o	COVER, FRONT
119	3−688−215−01	s	BUTTON, FL
120	3−688−217−02	o	HOLDER, HARNESS
121	3−688−218−01	o	CAM, SWITCH (L)
122	3−703−074−00	s	CAP 3, SHAFT

The shaded and ⚠ -marked components are critical to safety.
Replace only with same components as specified.

Chassis (1)

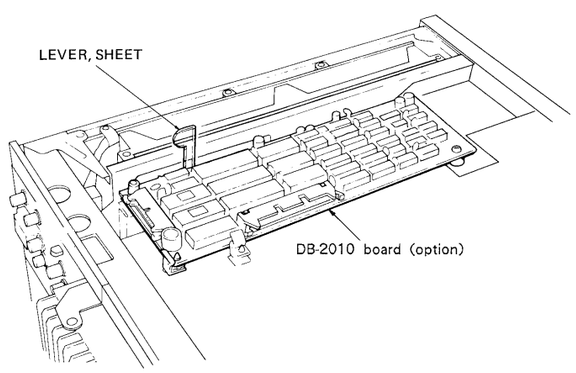


LDP-2000 (UC, J) (1)

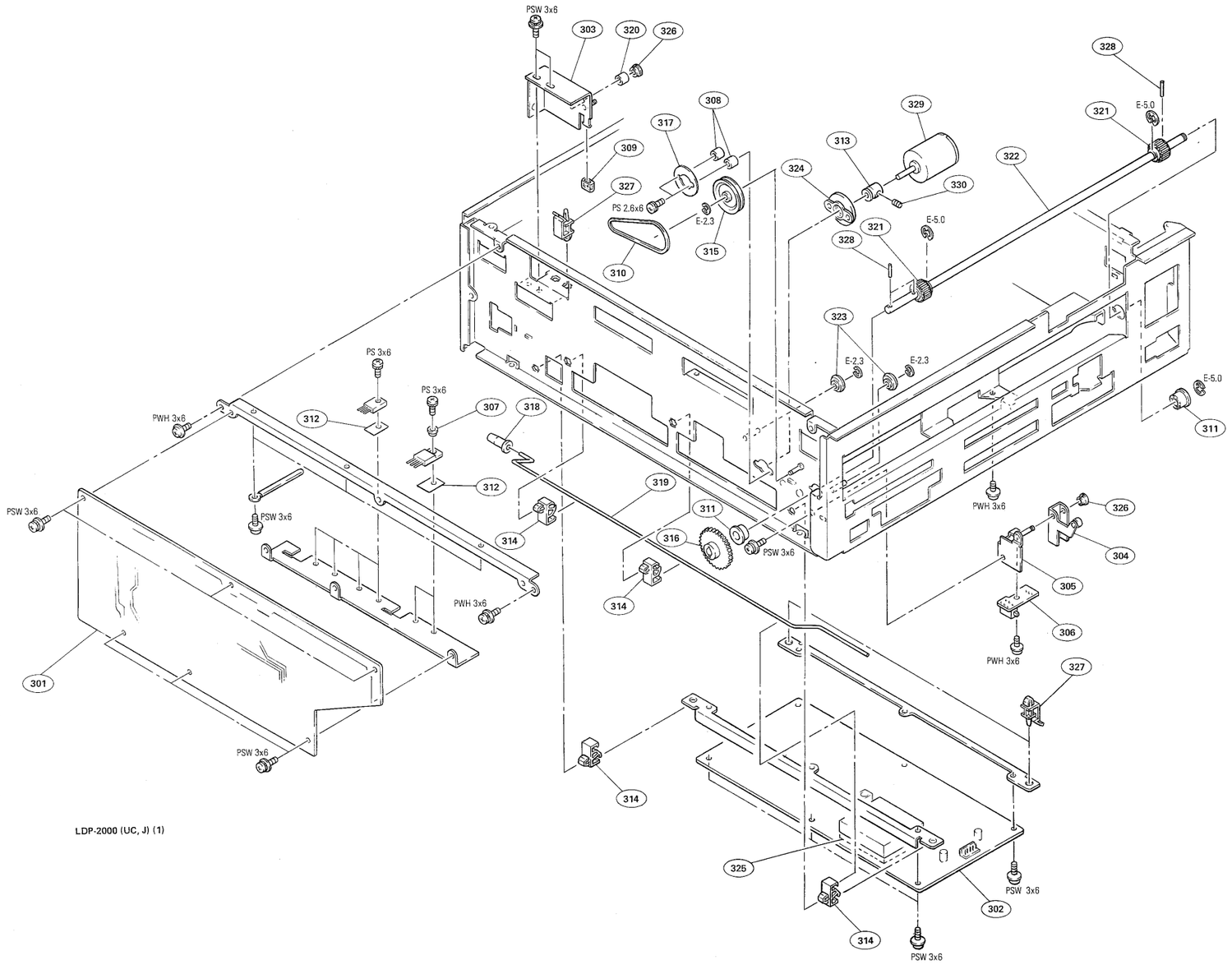
No.	Parts No.	SP	Description
201	A−6421−040−A	o	MOUNTED CIRCUIT BOARD, SY-30
202	A−6421−042−A	o	MOUNTED CIRCUIT BOARD, SV-65
203	A−6421−044−A	o	MOUNTED CIRCUI BOARD, SV-69
204	A−6421−046−A	o	MOUNTED CIRCUI BOARD, DM-45
205	X−3688−211−1	o	HOLDER ASSY, SWITCH
206	X−3688−212−1	o	STOPPER (RIGHT) ASSY
207	1−464−437−12	s	RECEIVER, REMOTE CONTROL
208	1−614−072−11	o	PC BOARD, DUS-28
209	1−614−076−11	o	PC BOARD, DL-11
210	1−614−085−11	o	PC BOARD, DU-74
211	1−616−229−11	o	SG-102 BOARD
212	1−616−230−11	o	SG-103 BOARD
213	3−688−381−01	o	SV-69 SHIELD
214	2−236−956−00	s	SCREW, STEP
215	3−483−026−00	s	RETAINER, THRUST, MOTOR
216	3−535−558−00	s	SPRING, TENSION
217	3−683−742−01	o	HINGE
218	3−688−207−01	s	ROLLER, STOPPER
219	3−688−244−02	o	SHUTTER
220	3−688−256−01	s	ROLLER (A), GUIDE
221	3−688−331−01	o	HOLDER, DELAY LINE
222	3−688−334−01	o	SHIELD (2) DM-45
223	3−688−335−01	o	SHIELD (3)
224	3−688−337−01	o	LID, SHIELD, SV-69
225	3−703−074−00	s	CAP 3, SHAFT
226	4−310−385−00	o	HOLDER, WIRE

2. Add the Service Parts.

Parts No.	SP	Description
1-526-662-00	S	IC SOCKET, 40P (SY-30 Board)
3-688-377-01	O	LEVER, SHEET



Chassis (2)

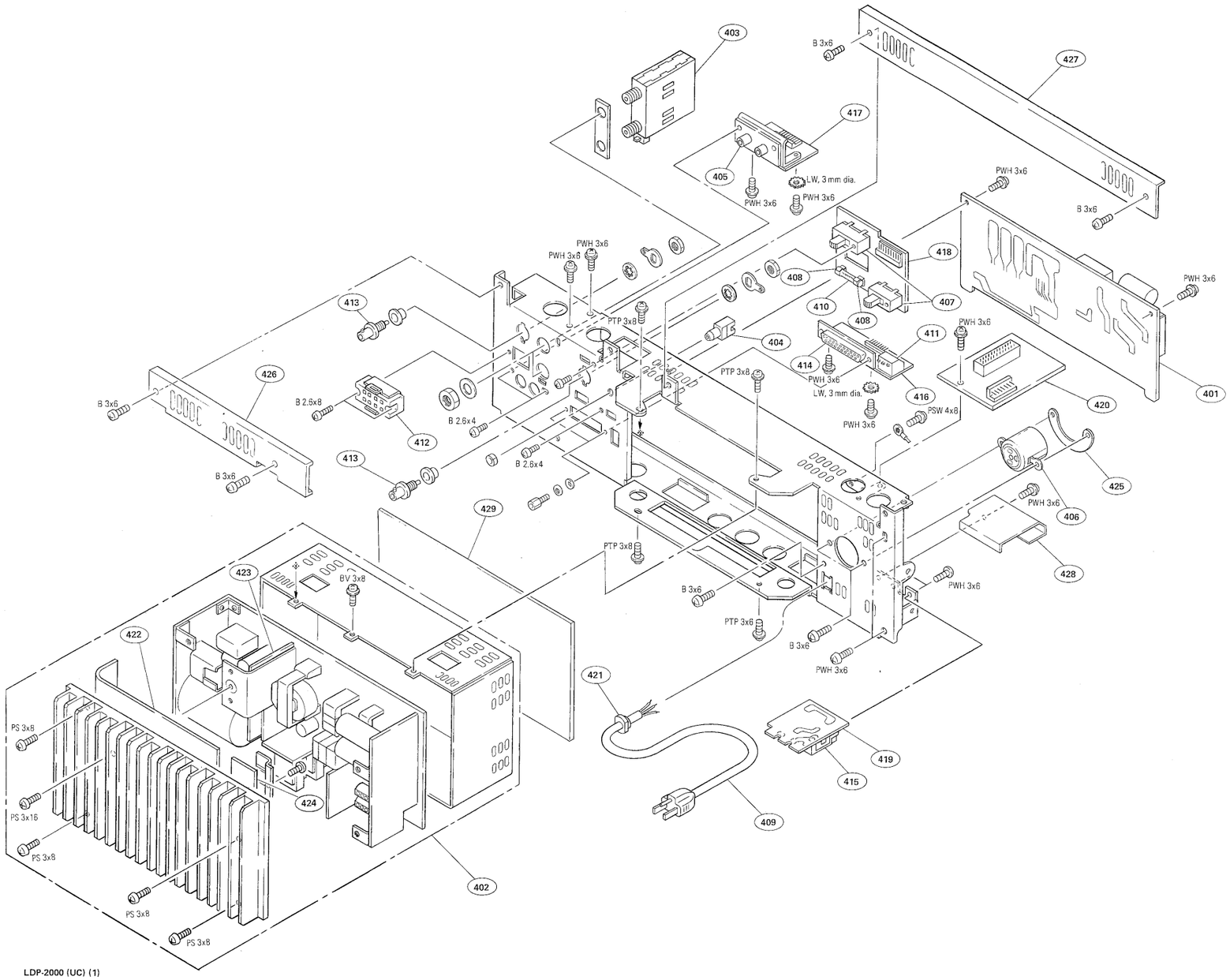


LDP-2000 (UC, J) (1)

No.	Parts No.	SP	Description
301	A−6421−036−A	o	MOUNTED CIRCUIT BOARD, SV-59
302	A−6421−038−A	o	MOUNTED CIRCUIT BOARD, SA-16
303	X−3688−213−1	o	STOPPER (LEFT) ASSY
⚠ 304	X−3688−214−1	o	ARM ASSY, SWITCH (LEFT)
⚠ 305	X−3688−215−1	o	HOLDER ASSY, SWITCH (LEFT)
306	1−614−057−12	o	PC BOARD, DUS-23
307	2−832−007−00	s	BUSHING (K), INSULATING
308	3−307−259−11	s	SPACER (2.6×3.5)
309	3−483−026−00	s	RETAINER, THRUST, MOTOR
310	3−534−779−00	s	BELT, DRIVE
311	3−642−595−02	s	BEARING (6)
312	3−660−978−00	s	SHEET, HEAT RESISTING
313	3−668−302−00	s	PULLEY, MOTOR
314	3−674−805−00	o	HOLDER, PC BOARD
315	3−688−201−01	s	PULLEY, G
316	3−688−202−01	s	GEAR, DRIVE
317	3−688−204−01	o	WASHER, M
318	3−688−205−01	o	HOLDER, W
319	3−688−206−02	s	WIRE, SWITCH
320	3−688−207−01	s	ROLLER, STOPPER
321	3−688−246−02	s	GEAR, PINION
322	3−688−247−01	s	SHAFT, DRIVE
323	3−688−256−01	s	ROLLER (A), GUIDE
324	3−688−257−01	o	DAMPER
325	3−688−333−01	o	SHIELD (REAR), SA
326	3−703−074−00	s	CAP 3, SHAFT
327	3−703−141−00	o	HOLDER, PCB
328	3−703−358−03	s	PIN, PARALLEL (DIA. 2×8)
329	8−835−055−01	s	MOTOR, DC (DNR-4700A)
330	3−701−506−01	s	SET SCREW 3×4

The shaded and ⚠ -marked components are critical to safety.
Replace only with same components as specified.

Connector Panel

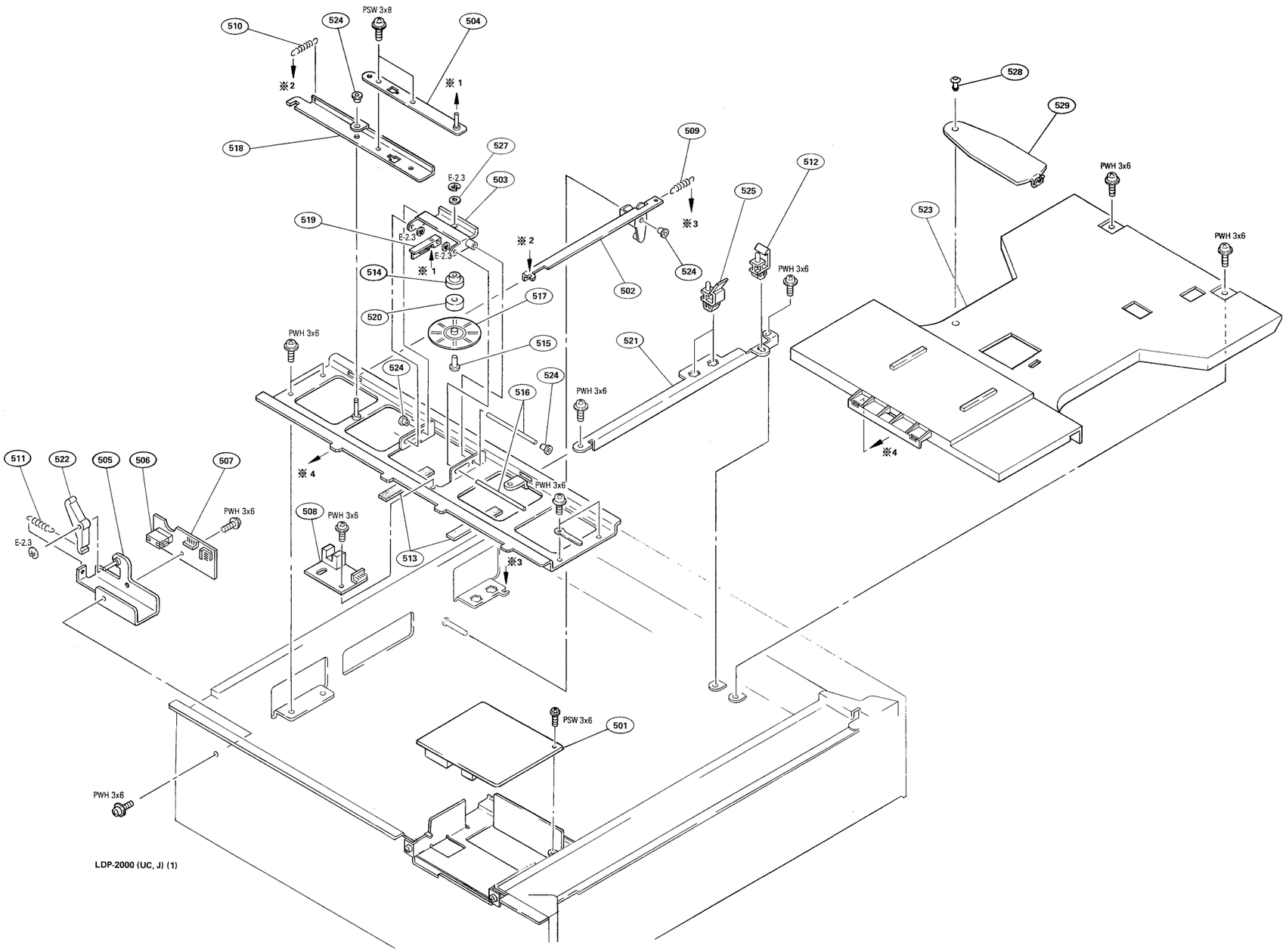


LDP-2000 (UC) (1)

No.	Parts No.	SP	Description
401	A−6421−048−A	o	MOUNTED CIRCUIT BOARD, AC-49
⚠ 402	1−413−185−11	s	SWITCHING REGULATOR (UR-12)
403	1−464−423−21	s	UNIT, COLOR RF
404	1−507−195−21	s	SPECIAL JACK "LOCK PULSE"
405	1−507−732−00	s	JACK, PIN 2P "LINE OUT"
⚠ 406	1−509−841−00	s	OUTLET, AC
407	1−516−576−00	s	SLIDE SWITCH "AUTO REPEAT ON/OFF"
408	1−517−072−00	s	LAMP HOLDER
⚠ 409	1−534−517−00	s	CORD, AC
410	1−548−119−21	s	HOURS METER
411	1−554−149−00	s	SWITCH, DIP
412	1−561−671−00	s	SOCKET, MULTI CONNECTOR 8P "TV CONNECTOR"
413	1−561−781−21	s	CONNECTOR, BNC (RECEPTACLE) "VIDEO OUT/SYNC IN"
414	1−562−411−11	s	CONNECTOR, D-SUB 25P "RS-232C"
⚠ 415	1−570−102−11	s	SWITCH, PUSH (AC POWER) (1 KEY)
416	1−614−056−11	o	PC BOARD, DUS-13
417	1−614−069−11	o	PC BOARD, DU-84
418	1−614−070−12	o	PC BOARD, DUS-12
419	1−614−074−11	o	PC BOARD, SW-87
420	1−614−075−12	o	PC BOARD, DUS-29
⚠ 421	2−045−063−00	s	STOPPER, CORD
422	2−430−448−01	o	SILICON RUBBER
423	2−430−449−01	o	SILICON RUBBER
424	2−430−450−01	o	SILICON RUBBER
425	3−651−491−00	o	NUT, (AC), PLATE
426	3−688−312−01	o	PANEL (LEFT), REAR
427	3−688−313−01	o	PANEL (RIGHT), REAR
428	3−688−340−01	o	COVER, AC
429	3−688−346−02	o	SHEET, INSULATING

The shaded and ⚠ -marked components are critical to safety.
Replace only with same components as specified.

Chuck Ass'y

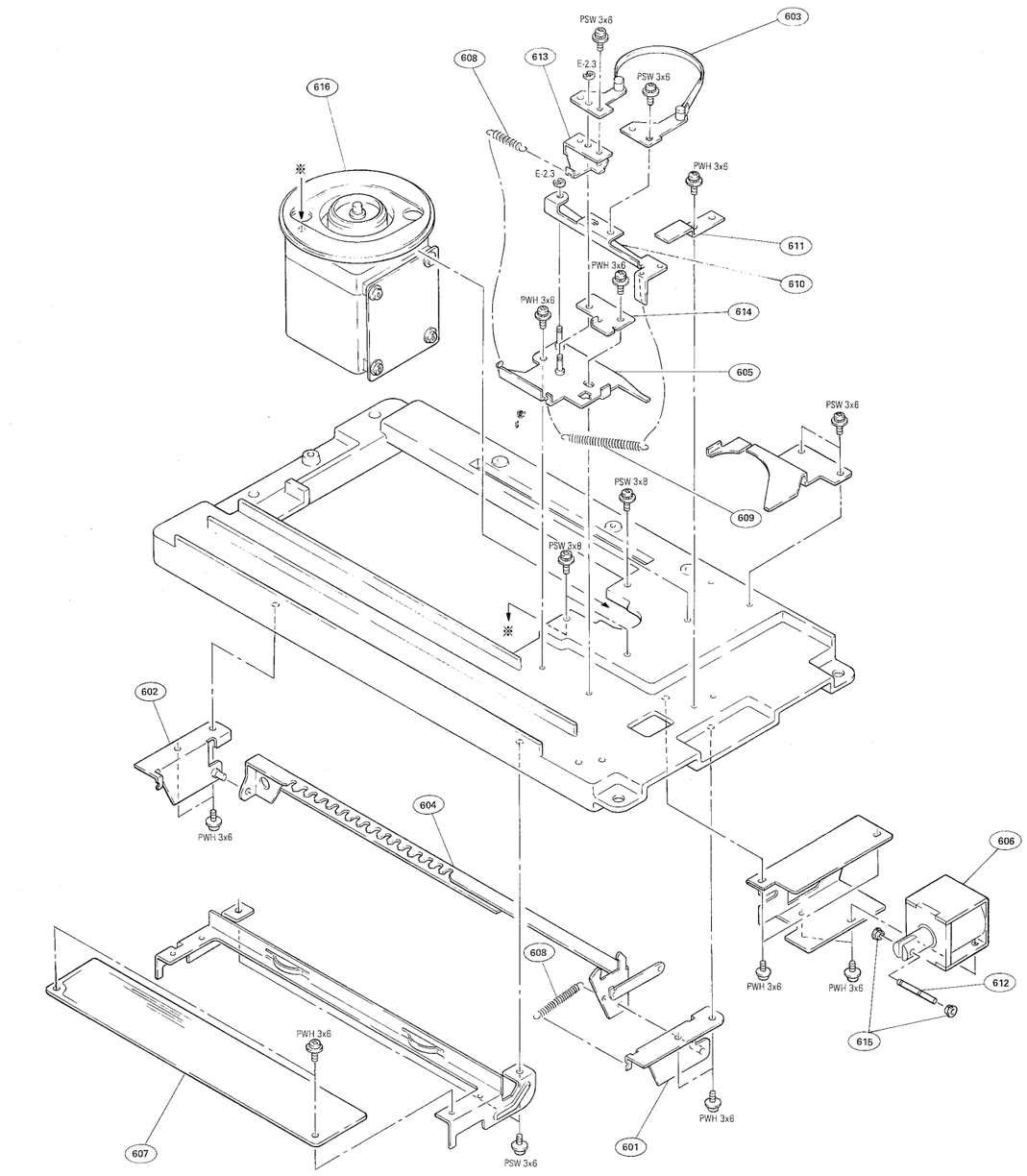


LDP-2000 (UC, J) (1)

No.	Parts No.	SP	Description
501	A−6421−065A	o	MOUNTED CIRCUIT BOARD, MC-25
502	X−3688−201−2	o	ARM ASSY, C
503	X−3688−208−1	o	HOLDER ASSY, C
504	X−3688−210−2	o	PLATE ASSY, ADJUSTMENT
505	X−3688−224−1	o	BASE ASSY, S
⚠ 506	1−554−932−11	s	SWITCH, PUSH "SAFETY"
507	1−614−060−11	o	PC BOARD, DUS-27
508	1−614−067−11	o	PC BOARD, DU-82
509	3−140−194−XX	s	SPRING, TENSION
510	3−701−788−XX	s	SPRING, TENSION
511	3−669−980−00	s	SPRING, TENSION
512	3−680−721−00	o	HOLDER, CHASSIS
513	3−688−228−01	o	CUSHION
514	3−688−229−02	o	HOLDER, B
515	3−688−230−01	o	PIN, CENTER
516	3−688−231−01	o	BAR
517	3−688−232−01	s	CHUCK
518	3−688−233−01	o	LINK (3)
519	3−688−234−02	o	JOINT
520	3−688−235−01	s	BEARING (NO FLANGE), BALL
521	3−688−296−01	o	HOLDER, OPTION
522	3−688−307−01	o	LEVER, S
523	3−688−308−03	o	COVER, LASER
524	3−703−074−00	s	CAP 3, SHAFT
525	3−703−141−00	o	HOLDER, PCB
527	3−701−439−21	s	WASHER
528	3−646−090−11	s	RIVET, NYLON (4×5)
529	3−688−388−01	o	COVER CAP, LASER

The shaded and ⚠ -marked components are critical to safety.
Replace only with same components as specified.

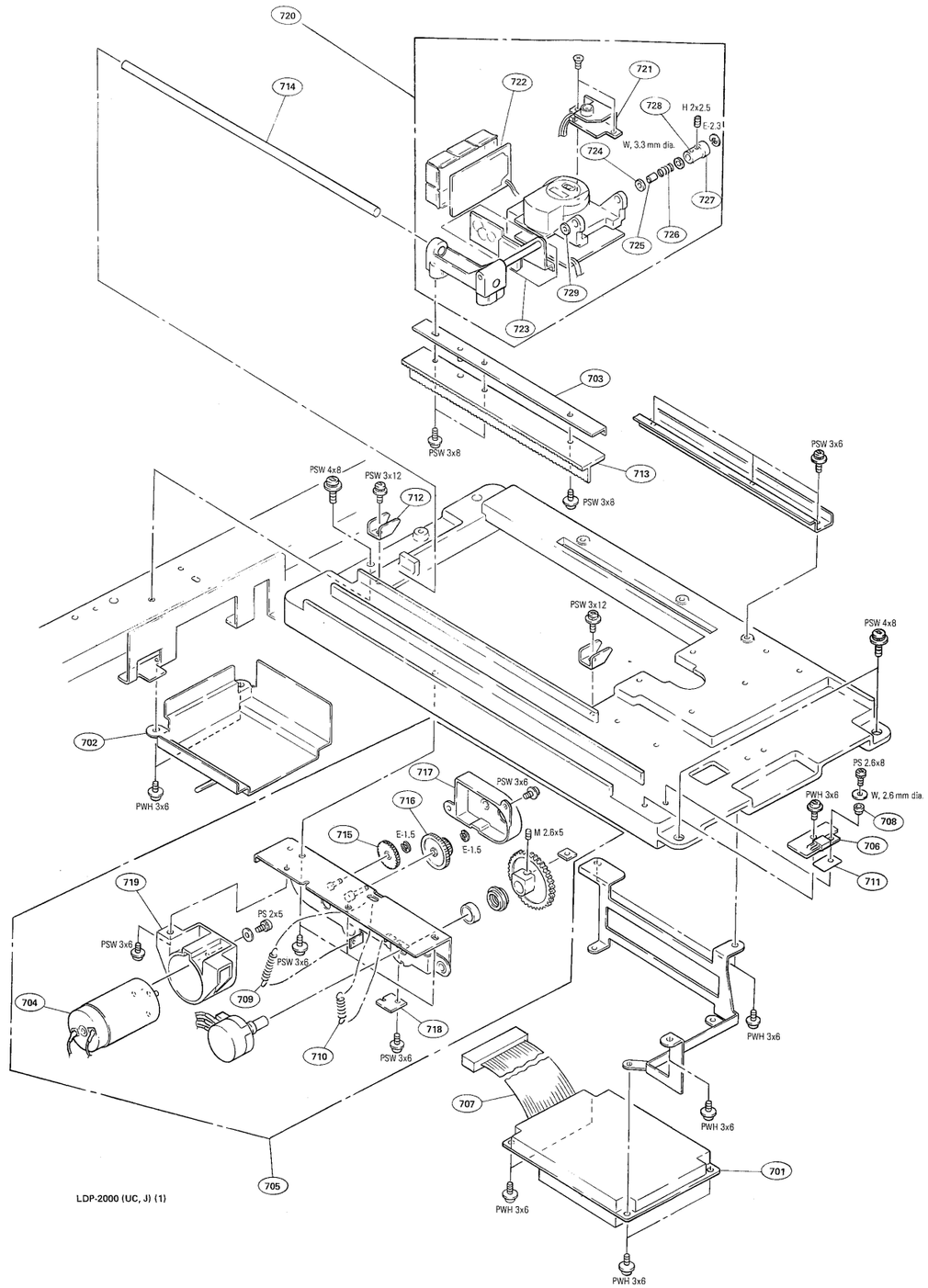
Sled Base (1)



LDP-2000 (UC, J)

No.	Parts No.	SP	Description
601	X−3688−216−1	o	RETAINER (FRONT) ASSY STOPPER
602	X−3688−217−2	o	RETAINER (REAR) ASSY STOPPER
603	A−6491−020−B	s	BAND ASSY, BRAKE
604	X−3688−222−2	o	PLATE ASSY, STOPPER
605	X−3688−236−1	o	BASE ASSY
606	1−454−274−22	s	SOLENOID, PLUNGER
607	1−614−065−11	o	PC BOARD, DUS-25
608	3−701−788−XX	s	SPRING, TENSION
609	3−630−622−00	s	SPRING
610	3−688−262−03	o	ARM, BRAKE
611	3−688−272−02	o	STOPPER, ARM, BRAKE
612	3−688−278−01	s	PIN, SOLENOID, RELEASE
613	3−688−368−01	o	LIMITER, BRAKE
614	3−688−369−01	o	STOPPER, LIMITER
615	3−703−074−00	s	CAP 3, SHAFT
616	8−838−084−01	s	MOTOR, DC (BHF-3700B) SPINDLE

Sled Base (2)



LDP-2000 (UC, J) (1)

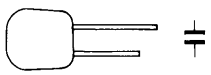
No.	Parts No.	SP	Description
701	A−6421−033−A	o	MOUNTED CIRCUIT BOARD, RF-7
702	X−3688−225−2	o	PLATE ASSY, SHIELD, FLEXIBLE
703	X−3688−228−1	o	PLATE ASSY, RACK
704	X−3705−058−1	s	MOTOR ASSY
705	1−464−441−11	s	MOTOR BLOCK ASSY
706	1−614−059−12	o	PC BOARD, DUS-11
707	1−614−077−11	s	PC BOARD, FL-25
708	2−832−007−00	s	BUSHING (K), INSULATING
709	3−143−025−00	s	SPRING, TENSION
710	3−472−221−00	s	SPRING, TENSION
711	3−703−207−11	s	SHEET, HEAT RESISTING
712	3−688−314−01	o	CLAMP
713	3−688−316−02	s	RACK
714	3−688−322−02	o	SHAFT, GUIDE
715	3−707−142−01	s	GEAR (A)
716	3−707−143−01	s	GEAR (B)
717	3−707−144−01	o	COVER
718	3−707−145−01	o	STOPPER
719	3−707−149−01	o	HOLDER, MOTOR
⚠ 720	8−848−021−01	s	OPTICAL BLOCK ASSY (KSS-140A)
721	X−2640−731−1	s	SKEW SENSOR ASSY
722	A−4915−010−A	s	MOUNTED CIRCUIT BOARD, RF
723	X−2640−707−1	s	SKEW DRIVE ASSY
724	2−621−815−01	s	WASHER
725	3−650−528−01	s	COLLAR
726	3−539−846−01	s	SPRING COIL
727	2−640−722−01	s	BEARING
728	2−640−708−01	s	ECCENTRICITY COLLAR
729	3−701−443−21	s	POLY SLIDER

The shaded and ⚠ -marked components are critical to safety.
Replace only with same components as specified.

8-3. ELECTRICAL PARTS LIST

Parts that are not listed in the "reference numbers order list" are shown in following table.
Reference numbers are omitted.

SILVERED MICA CAPACITOR 1 pF through 620 pF ±5%, 50WV



Parts No. 1-107-□□□-00

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
1 pF	098	15 pF	065	51 pF	078	180 pF	091
2	099	16	066	56	079	200	092
3	100	18	067	62	080	220	093
4	101	20	068	68	081	240	094
5	102	22	069	75	082	270	095
6	103	24	070	82	083	300	096
7	104	27	071	91	084	330	097
8	105	30	072	100	085	360	231
9	106	33	073	110	086	390	232
10	061	36	074	120	087	430	233
11	062	39	075	130	088	470	234
12	063	43	076	150	089	510	235
13	064	47	077	160	090	560	236
						620	237

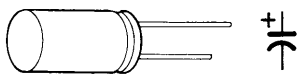
CERAMIC CAPACITOR 0.001μF through 0.1μF 50WV

Parts NO. 1-161-□□□-00

Value	Parts No. -□□□-	Substitute	Value	Parts No. -□□□-	Substitute
0.001 μF	039	(1-102-074-00)	0.01 μF	051	(1-101-118-00)
0.0012	040		0.012	052	
0.0015	041		0.015	053	
0.0018	042		0.018	054	
0.0022	043	(1-102-100-00)	0.022	055	(1-101-005-00)
0.0027	044		0.027	056	
0.0033	045		0.033	057	
0.0039	046	(1-102-124-00)	0.039	058	
0.0047	047		0.047	059	(1-101-006-00)
0.0056	048		0.056	060	
0.0068	049		0.068	061	
0.0082	050		0.082	062	
			0.1	063	

ELECTROLYTIC CAPACITOR

0.47μF through 470μF
6.3WV through 50 (63, 100)WV



Parts No. 1-123-□□□-00

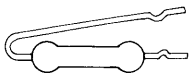
Value		Parts No. −□□□−
0.47μF	50V	
	100	379
1	50	
	100	380
2.2	50	
	100	381
3.3	25	
	35	
	50	
	100	382
4.7	25	
	35	
	50	
	63	369
10	10	
	16	
	25	
	35	
	50	356
22	16	
	25	330

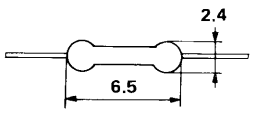
Value		Parts No. −□□□−
22μF	35V	342
	50	
	63	371
33	6.3	
	10	
	16	318
	25	
	35	343
	50	
	63	372
47	6.3	
	10	306
	16	
	25	332
	35	
	50	359
100	6.3	
	10	307
	16	
	25	333
	35	345

Value		Parts No. −□□□−
100μF	50V	360
220	6.3	
	10	308
	16	321
	25	334
	35	346
	50	361
330	6.3	
	10	309
	16	322
	25	335
	35	347
	50	362
470	6.3	298
	10	310
	16	323
	25	336
	35	348
	50	
	63	377

CARBON RESISTOR (1/4W)

± 5%, 1/4W, non-special type
1 Ω through 1 MΩ





Parts No. 1-246-□□□-00

Value	Parts No. -□□□-
1 Ω	401
1.1	402
1.2	403
1.3	404
1.5	405
1.6	406
1.8	407
2	408
2.2	409
2.4	410
2.7	411
3	412
3.3	413
3.6	414
3.9	415
4.3	416
4.7	417
5.1	418
5.6	419
6.2	420
6.8	421
7.5	422
8.2	423
9.1	424
10 Ω	425
11	426
12	427
13	428
15	429
16	430
18	431
20	432
22	433
24	434
27	435
30	436

Value	Parts No. -□□□-
33 Ω	437
36	438
39	439
43	440
47	441
51	442
56	443
62	444
68	445
75	446
82	447
91	448
100 Ω	449
110	450
120	451
130	452
150	453
160	454
180	455
200	456
220	457
240	458
270	459
300	460
330	461
360	462
390	463
430	464
470	465
510	466
560	467
620	468
680	469
750	470
820	471
910	472

Value	Parts No. -□□□-
1 kΩ	473
1.1	474
1.2	475
1.3	476
1.5	477
1.6	478
1.8	479
2	480
2.2	481
2.4	482
2.7	483
3.0	484
3.3	485
3.6	486
3.9	487
4.3	488
4.7	489
5.1	490
5.6	491
6.2	492
6.8	493
7.5	494
8.2	495
9.1	496
10 kΩ	497
11	498
12	499
13	500
15	501
16	502
18	503
20	504
22	505
24	506
27	507
30	508

Value	Parts No. -□□□-
33 kΩ	509
36	510
39	511
43	512
47	513
51	514
56	515
62	516
68	517
75	518
82	519
91	520
100 kΩ	521
110	522
120	523
130	524
150	525
160	526
180	527
200	528
220	529
240	530
270	531
300	532
330	533
360	534
390	535
430	536
470	537
510	538
560	539
620	540
680	541
750	542
820	543
910	544
1 MΩ	545

CARBON RESISTOR (1/8W)

±5%, 1/8W, non-special type
2.2Ω through 1MΩ

Parts No. 1-246-□□□-00

Value	Parts No. −□□□−
1Ω	–
1.1	–
1.2	–
1.3	–
1.5	–
1.6	–
1.8	–
2	–
2.2	751
2.4	812
2.7	752
3	813
3.3	753
3.6	814
3.9	754
4.3	815
4.7	755
5.1	816
5.6	756
6.2	817
6.8	757
7.5	818
8.2	758
9.1	819
10Ω	759
11	820
12	760
13	821
15	761
16	822
18	762
20	823
22	763
24	824
27	764
30	825

Value	Parts No. −□□□−
33Ω	765
36	826
39	766
43	827
47	767
51	828
56	768
62	829
68	769
75	830
82	770
91	831
100Ω	771
110	832
120	772
130	833
150	773
160	834
180	774
200	835
220	775
240	836
270	776
300	837
330	777
360	838
390	778
430	839
470	779
510	840
560	780
620	841
680	781
750	842
820	782
910	843

Value	Parts No. −□□□−
1kΩ	783
1.1	844
1.2	784
1.3	845
1.5	785
1.6	846
1.8	786
2	847
2.2	787
2.4	848
2.7	788
3.0	849
3.3	789
3.6	850
3.9	790
4.3	851
4.7	791
5.1	852
5.6	792
6.2	853
6.8	793
7.5	854
8.2	794
9.1	855
10kΩ	795
11	856
12	796
13	857
15	797
16	858
18	798
20	859
22	799
24	860
27	800
30	861

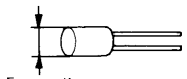
Value	Parts No. −□□□−
33kΩ	801
36	862
39	802
43	863
47	803
51	864
56	804
62	865
68	805
75	866
82	806
91	867
100kΩ	807
110	868
120	808
130	869
150	809
160	870
180	810
200	871
220	811

Parts No. 1-247-□□□-00

Value	Parts No. −□□□−
240kΩ	054
270	046
300	055
330	047
360	056
390	048
430	057
470	049
510	058
560	050
620	059
680	051
750	060
820	052
910	061
1MΩ	053

MICRO INDUCTOR

1 μH through 470 μH
±5%



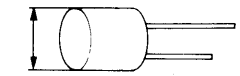
5mm dia

Parts No. 1-407-□□□-XX

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
1 μH	178	4.7 μH	186	22 μH	161	100 μH	169
1.2	179	5.6	187	27	162	120	170
1.5	180	6.8	188	33	163	150	171
1.8	181	8.2	189	39	164	180	172
2.2	182	10	157	47	165	220	173
2.7	183	12	158	56	166	270	174
3.3	184	15	159	68	167	330	175
3.9	185	18	160	82	168	390	176
						470	177

MICRO INDUCTOR

470 μH through 33 mH
±5%



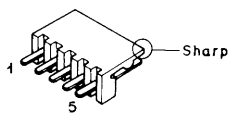
10mm dia

Parts No. 1-407-□□□-00

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
470 μH	488	1.5 mH	494	4.7 mH	500	15 mH	506
560	489	1.8	495	5.6	501	18	507
680	490	2.2	496	6.8	502	22	508
820	491	2.7	497	8.2	503	27	509
1 mH	492	3.3	498	10	504	33	510
1.2	493	3.9	499	12	505		

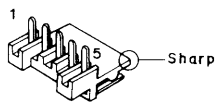
CONNECTOR

top-type receptacle



2P	1-508-900-00
3P	1-508-901-00
4P	1-508-902-00
5P	1-508-903-00
6P	1-508-904-00
8P	1-508-905-00
10P	1-508-906-00
12P	1-508-949-00

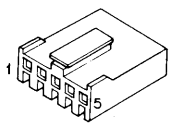
side-type receptacle



2P	1-508-933-00
3P	1-508-934-00
4P	1-508-950-00
5P	1-508-935-00
6P	1-508-936-00
8P	1-508-937-00
10P	1-508-951-00
12P	1-508-997-00

plug

housing



2P	1-509-983-00
3P	1-509-984-00
4P	1-509-985-00
5P	1-509-986-00
6P	1-509-987-00
8P	1-509-988-00
10P	1-509-989-00
12P	1-561-056-00

contact

1-509-982-00

ABBREVIATIONS

Ref. No.	Description	Ref. No.	Description	Ref. No.	Description
C□□, CV□□	CAPACITOR	IC□□	IC	R□□, RV□□	RESISTOR
CN□□	CONNECTOR	J□□	JACK	RY□□	RELAY
D□□	DIODE	L□□	INDUCTOR	S□□, SW□□	SWITCH
DL□□	DELAY LINE	M□□	MOTOR	T□□	TRANSFORMER
F□□	FUSE	PM□□	SOLENOID	TH□□	THERMISTOR
FB□□	FERRITE BEAD	Q□□	TRANSISTOR	X□□	CRYSTAL
FL□□	FILTER				

All capacitors are in micro farads unless otherwise specified.

All inductors are in micro henries unless otherwise specified.

All resistors are in ohms.

Ref.No.	Parts No.	SP	Description
RF-7 BOARD			
	A−6421−033−A	o	MOUNTED CIRCUIT BOARD, RF-7
	1−561−724−00	o	SOCKET, CONNECTOR
C31	1−107−046−00	s	MICA 4.7PF 500V
C32	1−107−046−00	s	MICA 4.7PF 500V
CN1	1−562−686−11	o	26P
CN9	1−560−914−00	s	2P
D1	8−719−100−36	s	RD5.6E-B3
D2	8−719−911−19	s	1SS119
⚠ IC1	8−759−179−05	s	μPC7905H
IC2	8−759−705−58	s	NJM4558D-D
IC3	8−759−990−82	s	TL082CP

Ref.No.	Parts No.	SP	Description
Q1	8−729−606−33	s	2SC2603-F
Q2	8−729−606−33	s	2SC2603-F
Q3	8−729−606−33	s	2SC2603-F
Q4	8−729−606−33	s	2SC2603-F
Q5	8−729−606−33	s	2SC2603-F
Q6	8−729−606−33	s	2SC2603-F
Q7	8−729−606−33	s	2SC2603-F
Q8	8−729−374−02	s	2SB740-3
Q9	8−729−606−33	s	2SC2603-F
Q10	8−729−606−33	s	2SC2603-F
Q11	8−729−612−77	s	2SA1027R
R21	1−215−430−00	s	METAL FILM 2.4K 1% 1/6W
R25	1−215−422−00	s	METAL FILM 1.1K 1% 1/6W
LE-23 BOARD			
	A−6421−034−A	o	MOUNTED CIRCUIT BOARD, LE-23
D1	8−719−911−19	s	1SS119
D2	8−719−911−19	s	1SS119
D3	8−719−911−19	s	1SS119
D4	8−719−911−19	s	1SS119
D5	8−719−919−45	s	GL-4HD5

The shaded and ⚠ -marked components are critical to safety.
Replace only with same components as specified.

Ref.No.	Parts No.	SP	Description
D6	8−719−919−40	s	GL-112R9
D7	8−719−901−47	s	LT-9010D
D8	8−719−901−47	s	LT-9010D
D9	8−719−901−47	s	LT-9010D
D10	8−719−901−47	s	LT-9010D
D11	8−719−911−19	s	1SS119
IC1	8−759−924−07	s	IR2406G
R1	1−215−446−00	s	METAL FILM 11K 1% 1/6W
R2	1−215−461−00	s	METAL FILM 47K 1% 1/6W
R5	1−215−459−00	s	METAL FILM 39K 1% 1/6W
R6	1−215−442−00	s	METAL FILM 7.5K 1% 1/6W
R7	1−215−445−00	s	METAL FILM 10K 1% 1/6W
R8	1−215−456−00	s	METAL FILM 30K 1% 1/6W
R9	1−215−456−00	s	METAL FILM 30K 1% 1/6W

SV-59 BOARD

	A−6421−036−A	o	MOUNTED CIRCUIT BOARD, SV-59
	2−832−007−00	s	BUSHING (K) , INSULATING
	3−660−978−00	s	SHEET, HEAT RESISTING
C105	1−127−477−00	s	ELECT 0.47 5% 25V
C304	1−107−048−00	s	MICA 6.8PF 0.5PF 500V
C321	1−107−048−00	s	MICA 6.8PF 0.5PF 500V
C328	1−131−341−00	s	TANTALUM 0.1 20% 35V
C330	1−131−345−00	s	TANTALUM 0.47 20% 35V
C331	1−131−345−00	s	TANTALUM 0.47 20% 35V
C350	1−107−210−00	s	MICA 22PF 5% 500V
D101	8−719−911−19	s	1SS119
D102	8−719−911−19	s	1SS119
D103	8−719−911−19	s	1SS119
D104	8−719−911−19	s	1SS119
D105	8−719−911−19	s	1SS119
D106	8−719−911−19	s	1SS119
D107	8−719−911−19	s	1SS119
D108	8−719−911−19	s	1SS119
D109	8−719−911−19	s	1SS119
D110	8−719−911−19	s	1SS119
D111	8−719−911−19	s	1SS119
D112	8−719−911−19	s	1SS119
D301	8−719−911−19	s	1SS119
D302	8−719−911−19	s	1SS119
D303	8−719−911−19	s	1SS119
D306	8−719−191−07	s	RD9.1E
D307	8−719−191−07	s	RD9.1E
D308	8−719−911−19	s	1SS119
D309	8−719−911−19	s	1SS119
D310	8−719−911−19	s	1SS119
D311	8−719−911−19	s	1SS119
D313	8−719−911−19	s	1SS119
D314	8−719−911−19	s	1SS119
D315	8−719−911−19	s	1SS119
IC101	8−759−145−58	s	μPC4558C
IC102	8−759−240−30	s	TC4030BP
IC103	8−759−345−38	s	HD14538BP
IC104	8−759−990−82	s	TL082CP
IC105	8−759−145−58	s	μPC4558C
IC106	8−759−145−58	s	μPC4558C
IC107	8−759−145−58	s	μPC4558C
IC108	8−759−145−58	s	μPC4558C
IC109	8−759−729−03	s	NJM2903D
IC110	8−759−729−03	s	NJM2903D
IC111	8−759−145−58	s	μPC4558C
IC112	8−759−240−52	s	TC4052BP
IC113	8−759−135−80	s	μPC358C
IC114	8−759−108−05	s	μPC78LO5A
IC301	8−759−145−58	s	μPC4558C
IC302	8−759−990−82	s	TL082CP
IC303	8−759−145−58	s	μPC4558C
IC304	8−759−909−33	s	LM311P
IC305	8−759−145−58	s	μPC4558C
IC306	8−759−145−58	s	μPC4558C
IC307	8−759−145−58	s	μPC4558C
IC308	8−759−990−82	s	TL082CP
IC309	8−759−729−03	s	NJM2903D
IC310	8−759−345−38	s	HD14538BP
IC311	8−759−909−33	s	LM311P
IC312	8−759−729−03	s	NJM2903D
IC313	8−759−240−69	s	TC4069UBP
IC314	8−759−240−11	s	TC4011BP
IC315	8−759−240−30	s	TC4030BP
IC316	8−759−240−11	s	TC4011BP
Q101	8−729−245−83	s	2SC2458
Q102	8−729−245−83	s	2SC2458
Q103	8−729−245−83	s	2SC2458
Q104	8−729−201−04	s	2SC2878
Q105	8−729−245−83	s	2SC2458
Q106	8−729−245−83	s	2SC2458
Q107	8−729−201−04	s	2SC2878
Q108	8−729−245−83	s	2SC2458
Q109	8−729−201−04	s	2SC2878
Q110	8−729−177−43	s	2SD789

Ref.No.	Parts No.	SP	Description
Q111	8−729−374−02	s	2SB740
Q112	8−729−882−52	s	2SB825-R
Q113	8−729−255−31	s	2SD553
Q114	8−729−245−83	s	2SC2458
Q115	8−729−204−83	s	2SA1048-GR
Q116	8−729−245−83	s	2SC2458
Q117	8−729−201−04	s	2SC2878
Q118	8−729−204−83	s	2SA1048-GR
Q119	8−729−245−83	s	2SC2458
Q120	8−729−245−83	s	2SC2458
Q301	8−729−606−33	s	2SC2603-F
Q302	8−729−201−04	s	2SC2878
Q303	8−729−612−77	s	2SA1027R
Q304	8−729−105−71	s	2SK523-K2
Q305	8−729−282−42	s	2SC2824
Q306	8−729−208−42	s	2SA1184
Q307	8−729−201−04	s	2SC2878
Q308	8−729−612−77	s	2SA1027R
Q309	8−729−606−33	s	2SC2603-F
Q310	8−729−612−77	s	2SA1027R
Q311	8−729−612−77	s	2SA1027R
Q312	8−729−606−33	s	2SC2603-F
Q313	8−729−612−77	s	2SA1027R
Q314	8−729−201−04	s	2SC2878
Q315	8−729−612−77	s	2SA1027R
Q317	8−729−282−42	s	2SC2824
Q318	8−729−208−42	s	2SA1184
Q319	8−729−201−04	s	2SC2878
Q320	8−729−612−77	s	2SA1027R
Q321	8−729−105−71	s	2SK523-K2
Q322	8−729−612−77	s	2SA1027R
Q323	8−729−900−61	s	DTA144ES
R188	1−215−456−00	s	METAL FILM 30K 1% 1/6W
R220	1−210−828−00	s	CARBON 4.7M 5% 1/4W
⚠R324	1−207−908−00	s	WIREWOUND 2.7 10% 3W
R395	1−207−908−00	s	WIREWOUND 2.7 10% 3W
RV101	1−224−254−XX	s	VAR, METAL GLAZE 47K
RV102	1−224−252−XX	s	VAR, METAL GLAZE 10K
RV103	1−224−249−XX	s	VAR, METAL GLAZE 1K
RV104	1−224−249−XX	s	VAR, METAL GLAZE 1K
RV105	1−224−252−XX	s	VAR, METAL GLAZE 10K
RV301	1−224−255−XX	s	VAR, METAL GLAZE 100K
RV302	1−224−252−XX	s	VAR, METAL GLAZE 10K
RV303	1−224−252−XX	s	VAR, METAL GLAZE 10K
RV304	1−224−252−XX	s	VAR, METAL GLAZE 10K
RV305	1−224−254−XX	s	VAR, METAL GLAZE 47K
RV306	1−224−255−XX	s	VAR, METAL GLAZE 100K
RV307	1−224−134−XX		VAR, METAL GLAZE 470K
RV308	1−224−252−XX	s	VAR, METAL GLAZE 10K
RV309	1−224−254−XX	s	VAR, METAL GLAZE 47K

SA-16 BOARD

	A−6421−038−A	o	MOUNTED CIRCUIT BOARD, SA-16
	3−688−333−01	o	SHIELD, (REAR) SA
C61	1−124−007−11	s	ELECT (NONPOLAR) 22 20% 25V
C62	1−124−007−11	s	ELECT (NONPOLAR) 22 20% 25V
C73	1−124−007−11	s	ELECT (NONPOLAR) 22 20% 25V
C74	1−124−007−11	s	ELECT (NONPOLAR) 22 20% 25V
C77	1−130−495−00	s	FILM 0.1 5% 50V
C78	1−131−373−00	s	TANTALUM 22 10% 16V
C79	1−131−345−00	s	TANTALUM 0.47 10% 35V
C90	1−130−496−51	s	FILM 0.12 5% 50V
C91	1−130−496−51	s	FILM 0.12 5% 50V
D1	8−719−911−19	s	1SS119
D2	8−719−911−19	s	1SS119
D3	8−719−151−07	s	RD5.1E-B
D4	8−719−151−07	s	RD5.1E-B
D5	8−719−912−27	s	KV1226
D6	8−719−110−07	s	RD10E-B
D7	8−719−911−19	s	1SS119
D8	8−719−156−07	s	RD5.6E-B
D9	8−719−911−19	s	1SS119
D10	8−719−110−07	s	RD10E-B
D201	8−719−911−19	s	1SS119
D202	8−719−911−19	s	1SS119
D203	8−719−911−19	s	1SS119
D204	8−719−911−19	s	1SS119
FL1	1−235−039−00	s	BPF
FL2	1−235−038−00	s	BPF
IC1	8−759−201−69	s	TL8608P
IC2	8−759−324−11	s	HA12411
IC3	8−759−240−69	s	TC4069UBP
IC4	8−759−324−11	s	HA12411
IC5	8−759−705−58	s	NJM4558D-D

The shaded and ⚠-marked components are critical to safety.
Replace only with same components as specified.

Ref. No.	Parts No.	SP	Description
IC6	8−759−240−66	s	TC4066BP
IC7	8−759−705−58	s	NJM4558D-D
IC8	8−759−302−81	s	HA12043
IC9	8−759−240−52	s	TC4052BP
IC10	8−759−990−62	s	TL062CP
IC11	8−759−990−82	s	TL082CP
IC12	8−759−705−58	s	NJM4558D-D
IC13	8−759−705−58	s	NJM4558D-D
IC14	8−759−705−58	s	NJM4558D-D
IC201	8−759−705−58	s	NJM4558D-D
IC202	8−759−705−58	s	NJM4558D-D
IC203	8−759−729−03	s	NJM2903D
IC204	8−759−729−03	s	NJM2903D
IC205	8−759−705−58	s	NJM4558D-D
IC206	8−759−705−58	s	NJM4558D-D
IC207	8−759−241−75	s	TC40175BP
IC208	8−759−240−24	s	TC4024BP
IC209	8−759−240−24	s	TC4024BP
IC210	8−759−240−24	s	TC4024BP
IC211	8−759−240−13	s	TC4013BP
LV1	1−404−597−11	s	VAR, COIL, DETECTOR
LV2	1−404−598−11	s	VAR, COIL, DETECTOR
LV3	1−404−599−11	s	VAR, COIL, DETECTOR
LV4	1−404−600−11	s	VAR, COIL, DETECTOR
Q1	8−729−245−83	s	2SC2458
Q2	8−729−245−83	s	2SC2458
Q3	8−729−245−83	s	2SC2458
Q4	8−729−245−83	s	2SC2458
Q5	8−729−245−83	s	2SC2458
Q6	8−729−245−83	s	2SC2458
Q7	8−729−204−83	s	2SA1048-GR
Q8	8−729−245−83	s	2SC2458
Q9	8−729−204−83	s	2SA1048-GR
Q10	8−729−245−83	s	2SC2458
Q11	8−729−245−83	s	2SC2458
Q12	8−729−245−83	s	2SC2458
Q13	8−729−245−83	s	2SC2458
Q201	8−729−177−43	s	2SD774
Q202	8−729−103−43	s	2SB734
R84	1−215−829−11	s	METAL FILM 91K 1% 1/8W
R85	1−210−828−00	s	CARBON 4.7M 5% 1/4W
R215	1−214−581−00	s	METAL FILM 10K 1% 1/8W
R216	1−215−822−11	s	METAL FILM 47K 1% 1/8W
R217	1−214−581−00	s	METAL FILM 10K 1% 1/8W
R218	1−215−822−11	s	METAL FILM 47K 1% 1/8W
R241	1−246−401−00	s	CARBON 1 5% 1/4W

Ref. No.	Parts No.	SP	Description
RV2	1−224−251−XX	s	VAR, METAL GLAZE 4.7K
RV3	1−224−249−XX	s	VAR, METAL GLAZE 1K
RV4	1−224−249−XX	s	VAR, METAL GLAZE 1K
RV201	1−224−255−XX	s	VAR, METAL GLAZE 100K
RV202	1−224−252−XX	s	VAR, METAL GLAZE 10K

SY-30 BOARD

	A−6421−040−A	o	MOUNTED CIRCUIT BOARD, SY-30
	1−526−662−00	s	IC SOCKET, 40P
C15	1−131−408−00	s	TANTALUM 1 20% 35V
C19	1−131−408−00	s	TANTALUM 1 20% 35V
C25	1−107−158−00	s	MICA 30PF 5% 500V
C26	1−107−158−00	s	MICA 30PF 5% 500V
C28	1−131−408−00	s	TANTALUM 1 20% 35V
C38	1−107−158−00	s	MICA 30PF 5% 500V
C39	1−107−158−00	s	MICA 30PF 5% 500V
CV1	1−141−260−00	s	CERAMIC TRIMMER
D1	8−719−911−19	s	1SS119
D2	8−719−911−19	s	1SS119
D3	8−719−911−19	s	1SS119
D4	8−719−911−19	s	1SS119
D5	8−719−911−19	s	1SS119
D6	8−719−911−19	s	1SS119
D7	8−719−911−19	s	1SS119
D8	8−719−911−19	s	1SS119
D9	8−719−911−19	s	1SS119
D10	8−719−911−19	s	1SS119
D11	8−719−911−19	s	1SS119
D12	8−719−911−19	s	1SS119
IC1	8−759−240−66	s	TC4066BP
IC2	8−759−990−82	s	TL082CP
IC3	8−759−240−30	s	TC4030BP
IC4	8−759−240−11	s	TC4011BP
IC5	8−759−145−84	s	μPD4584BC
IC6	8−759−220−04	s	TC40H004P
IC7	8−759−345−38	s	HD14538BP
IC8	8−759−951−88	s	SN75188N
IC9	8−752−320−35	s	CXD1019S
IC10	8−759−600−24	s	M54543L
IC11	8−759−240−53	s	TC4053BP
IC12	8−759−951−89	s	SN75189AN
IC13	8−759−767−74	s	MBM2732A-SY30V2.1IC13
IC14	8−759−103−54	s	μPD1519AG
IC15	8−759−913−99	s	MB88201-173N

Ref. No.	Parts No.	SP	Description
IC16	8−759−303−04	s	HD68P01V07-1
IC16A	8−759−767−75	s	MBM2732A-SY30V2.1IC16
IC17	8−759−240−13	s	TC4013BP
IC18	8−759−200−07	s	TC40H157P
IC19	8−759−240−49	s	TC4049BP
IC20	8−759−240−49	s	TC4049BP
IC21	8−759−182−43	s	μPD8243C
IC22	8−759−182−43	s	μPD8243C
IC23	8−759−908−23	s	MB88303
IC24	8−759−220−04	s	TC40H004P
IC25	8−759−240−51	s	TC4051BP
IC26	8−759−240−40	s	TC4040BP
Q1	8−729−173−37	s	2SA733
Q2	8−729−663−48	s	2SC1364
Q3	8−729−663−48	s	2SC1364
Q4	8−729−173−37	s	2SA733
Q5	8−729−316−16	s	2SC1061
Q6	8−729−663−48	s	2SC1364
Q7	8−729−177−43	s	2SD774
Q8	8−729−663−48	s	2SC1364
⚠ R49	1−212−364−00	s	METAL OXIDE 2.2 5% 1W
RB1	1−231−387−00	s	RESISTOR NETWORK
RV1	1−224−661−00	s	VAR, METAL FILM 47K
RV2	1−224−661−00	s	VAR, METAL FILM 47K
X1	1−527−822−21	s	CERAMIC
X2	1−527−827−00	s	X'TAL

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Replace only with same components as specified.

Ref. No.	Parts No.	SP	Description
SV-65 BOARD			
	A−6421−042−A	o	MOUNTED CIRCUIT BOARD, SV-65
C6	1−161−907−00	s	CERAMIC 0.0012 5% 50V
C10	1−161−907−00	s	CERAMIC 0.0012 5% 50V
C14	1−161−907−00	s	CERAMIC 0.0012 5% 50V
C19	1−161−907−00	s	CERAMIC 0.0012 5% 50V
C42	1−107−210−00	s	MICA 22PF 5% 500V
CN5	1−508−903−00	s	5P
CN6	1−508−904−00	s	6P
D1	8−719−911−19	s	1SS119
D2	8−719−911−19	s	1SS119
D3	8−719−911−19	s	1SS119
D4	8−719−911−19	s	1SS119
D5	8−719−911−19	s	1SS119
D6	8−719−911−19	s	1SS119
D7	8−719−100−27	s	RD4.7E-B2
D8	8−719−182−07	s	RD8.2E-B
D9	8−719−182−07	s	RD8.2E-B
D10	8−719−911−19	s	1SS119
D11	8−719−911−19	s	1SS119
D12	8−719−911−19	s	1SS119
D13	8−719−911−19	s	1SS119
D14	8−719−911−19	s	1SS119
D15	8−719−911−19	s	1SS119
IC1	8−759−902−21	s	SN74LS221N
IC2	8−759−902−21	s	SN74LS221N
IC3	8−759−900−74	s	SN74LS74AN
IC4	8−759−900−74	s	SN74LS74AN
IC5	8−759−902−21	s	SN74LS221N
IC7	8−759−902−21	s	SN74LS221N
IC10	8−759−135−80	s	μPC358C
IC11	8−759−990−82	s	TL082CP
IC12	8−759−990−82	s	TL082CP
IC13	8−759−990−82	s	TL082CP
IC14	8−759−901−23	s	SN74LS123N
IC15	8−759−990−82	s	TL082CP
IC16	8−759−729−03	s	NJM2903D
IC17	8−759−240−16	s	TC4016BP
IC18	8−759−135−80	s	μPC358C
IC19	8−759−135−80	s	μPC358C
IC20	8−759−135−80	s	μPC358C
IC21	8−759−729−03	s	NJM2903D
IC22	8−759−240−53	s	TC4053BP
IC23	8−759−135−80	s	μPC358C
IC24	8−759−990−82	s	TL082CP
IC25	8−759−990−82	s	TL082CP

Ref. No.	Parts No.	SP	Description
Q1	8−729−364−12	s	2SC641K
Q2	8−729−245−83	s	2SC2458
Q3	8−729−245−83	s	2SC2458
Q4	8−729−364−12	s	2SC641K
Q5	8−729−364−12	s	2SC641K
Q6	8−729−218−43	s	2SK184-GR
Q7	8−729−364−12	s	2SC641K
Q8	8−729−364−12	s	2SC641K
Q9	8−729−364−12	s	2SC641K
Q10	8−729−364−12	s	2SC641K
Q11	8−729−218−43	s	2SK184-GR
Q12	8−729−245−83	s	2SC2458
Q13	8−729−364−12	s	2SC641K
Q14	8−729−201−04	s	2SC2878
Q15	8−729−245−83	s	2SC2458
Q16	8−729−204−83	s	2SA1048-GR
Q17	8−729−245−83	s	2SC2458
Q18	8−729−201−04	s	2SC2878
Q19	8−729−245−83	s	2SC2458
Q20	8−729−245−83	s	2SC2458
Q21	8−729−245−83	s	2SC2458
Q22	8−729−245−83	s	2SC2458
Q23	8−729−245−83	s	2SC2458
Q24	8−729−177−43	s	2SD774
Q25	8−729−177−43	s	2SD774
Q26	8−729−374−02	s	2SB740
Q27	8−729−316−16	s	2SC1061
Q28	8−729−245−83	s	2SC2458
Q30	8−729−245−83	s	2SC2458
Q31	8−729−245−83	s	2SC2458
Q32	8−729−245−83	s	2SC2458
Q33	8−729−201−04	s	2SC2878
Q34	8−729−245−83	s	2SC2458
Q35	8−729−201−04	s	2SC2878
Q36	8−729−245−83	s	2SC2458
R136	1−215−456−00	s	METAL FILM 30K 1% 1/6W
R137	1−215−450−00	s	METAL FILM 16K 1% 1/6W
RV1	1−224−251−XX	s	VAR, METAL GLAZE 4.7K
RV2	1−224−252−XX	s	VAR, METAL GLAZE 10K
RV3	1−224−253−XX	s	VAR, METAL GLAZE 22K
RV4	1−224−253−XX	s	VAR, METAL GLAZE 22K
RV5	1−224−249−XX	s	VAR, METAL GLAZE 1K
RV6	1−224−253−XX	s	VAR, METAL GLAZE 22K

Ref. No.	Parts No.	SP	Description
SV-69 BOARD			
	A−6421−044−A	o	MOUNTED CIRCUIT BOARD, SV-69 with SG-102, SG-103
	3−688−337−01	o	LID, SHIELD, SV-69
C5	1−102−959−00	s	CERAMIC 22PF 5% 50V
C15	1−101−001−00	s	CERAMIC 0.001 50V
C405	1−107−157−00	s	MICA 27PF 5% 500V
C406	1−107−157−00	s	MICA 27PF 5% 500V
CF101	1−527−604−00	s	CERAMIC
CV1	1−141−316−11	s	TRIMMER
D1	8−719−911−19	s	1SS119
D2	8−719−911−19	s	1SS119
D3	8−719−911−19	s	1SS119
D4	8−719−911−19	s	1SS119
D5	8−719−911−19	s	1SS119
D6	8−719−911−19	s	1SS119
D7	8−719−911−19	s	1SS119
D10	8−719−911−19	s	1SS119
D11	8−719−151−07	s	RD5.1E-B
D12	8−719−151−07	s	RD5.1E-B
D13	8−719−911−19	s	1SS119
D14	8−719−911−19	s	1SS119
D15	8−719−911−19	s	1SS119
D16	8−719−911−19	s	1SS119
IC1	8−759−902−21	s	SN74LS221N
IC2	8−759−901−23	s	SN74LS123N
IC3	8−759−900−00	s	SN74LS00N
IC4	8−759−901−23	s	SN74LS123N
IC5	8−759−901−23	s	SN74LS123N
IC6	8−759−900−74	s	SN74LS74AN
IC7	8−759−729−03	s	NJM2903D
IC8	8−759−729−03	s	NJM2903D
IC9	8−759−220−04	s	TC40H004P
IC10	8−759−250−03	s	TC5003P
IC11	8−759−990−82	s	TL082CP
IC12	8−759−990−82	s	TL082CP
IC13	8−759−900−10	s	SN74LS10N
IC14	8−759−951−07	s	SN75107AN
IC15	8−759−729−03	s	NJM2903D
IC16	8−759−220−04	s	TC40H004P
IC17	8−759−990−82	s	TL082CP
IC18	8−759−901−23	s	SN74LS123N
IC19	8−759−902−21	s	SN74LS221N
IC20	8−759−969−13	s	SN16913P

Ref. No.	Parts No.	SP	Description
IC21	8−752−006−10	s	CX20061
IC22	8−759−220−00	s	TC40H000P
IC23	8−759−220−00	s	TC40H000P
IC24	8−759−220−04	s	TC40H004P
IC25	8−759−220−00	s	TC40H000P
IC26	8−759−708−09	s	NJM78L09A
IC27	8−759−700−65	s	NJM79L05A
L2	1−407−157−XX	s	MICRO
L401	1−407−157−XX	s	MICRO
Q1	8−729−218−43	s	2SK184-GR
Q2	8−729−204−83	s	2SA1048-GR
Q3	8−729−204−83	s	2SA1048-GR
Q4	8−729−245−83	s	2SC2458
Q5	8−729−245−83	s	2SC2458
Q6	8−729−245−83	s	2SC2458
Q7	8−729−245−83	s	2SC2458
Q8	8−729−204−83	s	2SA1048-GR
Q9	8−729−245−83	s	2SC2458
Q10	8−729−245−83	s	2SC2458
Q11	8−729−245−83	s	2SC2458
Q12	8−729−112−06	s	2SA1206
Q13	8−729−245−83	s	2SC2458
Q14	8−729−245−83	s	2SC2458
Q15	8−729−204−83	s	2SA1048-GR
Q17	8−729−245−83	s	2SC2458
Q18	8−729−245−83	s	2SC2458
Q19	8−729−245−83	s	2SC2458
Q20	8−729−245−83	s	2SC2458
Q21	8−729−245−83	s	2SC2458
Q22	8−729−245−83	s	2SC2458
R10	1−215−446−00	s	METAL FILM 11K 1% 1/6W
R503	1−215−446−00	s	METAL FILM 11K 1% 1/6W
R504	1−215−434−00	s	METAL FILM 3.6K 1% 1/6W
R509	1−215−446−00	s	METAL FILM 11K 1% 1/6W
R510	1−215−434−00	s	METAL FILM 3.6K 1% 1/6W
R525	1−215−446−00	s	METAL FILM 11K 1% 1/6W
R526	1−215−434−00	s	METAL FILM 3.6K 1% 1/6W
RV1	1−224−252−XX	s	VAR, METAL GLAZE 10K
RV2	1−224−252−XX	s	VAR, METAL GLAZE 10K
RV3	1−224−252−XX	s	VAR, METAL GLAZE 10K
RV4	1−224−252−XX	s	VAR, METAL GLAZE 10K
RV5	1−224−251−XX	s	VAR, METAL GLAZE 4.7K
RV6	1−224−251−XX	s	VAR, METAL GLAZE 4.7K
X401	1−527−227−00	s	X'TAL
	1−616−229−11	o	PRINTED CIRCUIT BOARD, SG-102
	1−616−230−11	o	PRINTED CIRCUIT BOARD, SG-103
C603	1−124−225−00	s	ELECT 100 20% 6.3V
C609	1−124−230−51	s	ELECT 47 20% 10V
C610	1−124−230−11	s	ELECT 47 20% 10V
D601	8−719−911−19	s	1SS119
IC601	8−752−006−10	s	CX20061
IC701	8−759−902−21	s	SN74LS221N
IC702	8−759−900−00	s	SN74LS00N
IC703	8−759−240−40	s	TC4040BP
IC704	8−759−240−12	s	TC4012BP
IC705	8−759−006−10	s	CX20061
L601	1−407−697−00	s	MICRO 22
L602	1−407−697−00	s	MICRO 22
Q601	8−729−603−50	s	2SC403SP
Q602	8−729−603−50	s	2SC403SP
Q603	8−729−603−50	s	2SC403SP
Q604	8−729−603−50	s	2SC403SP
Q701	8−729−603−50	s	2SC403SP

DM-45 BOARD

	A−6421−046−A	o	MOUNTED CIRCUIT BOARD, DM-45 with DL-11
	1−560−035−00	s	BOARD TO BOARD 5P
	1−614−076−11	o	PRINTED CIRCUIT BOARD, DL-11
	3−688−331−01	o	DELAY LINE HOLDER
	3−688−334−01	o	SHIELD (2)
	3−688−335−01	o	SHIELD (3)

Ref. No.	Parts No.	SP	Description
C7	1−107−210−00	s	MICA 22PF 5% 500V
C8	1−107−049−00	s	MICA 8.2PF 500V
C28	1−107−206−00	s	MICA 15PF 5% 500V
C38	1−107−049−00	s	MICA 8.2PF 500V
C39	1−107−049−00	s	MICA 8.2PF 500V
C40	1−107−159−00	s	MICA 33PF 5% 500V
C41	1−107−049−00	s	MICA 8.2PF 500V
C42	1−107−157−00	s	MICA 27PF 5% 500V
C46	1−107−210−00	s	MICA 22PF 5% 500V
C64	1−127−473−00	s	ELECT 0.1 5% 25V
C70	1−107−157−00	s	MICA 27PF 5% 50V
C110	1−107−210−00	s	MICA 22PF 5% 500V
C111	1−107−206−00	s	MICA 15PF 5% 500V
C112	1−107−026−00	s	MICA 5.1PF 500V
C120	1−107−074−00	s	MICA 36PF 5% 50V
C121	1−107−207−00	s	MICA 16PF 5% 500V
C145	1−127−473−00	s	ELECT 0.1 5% 25V
C196	1−107−210−00	s	MICA 22PF 5% 500V
C301	1−102−246−00	s	CERAMIC 47PF 10% 150V
C302	1−102−246−00	s	CERAMIC 47PF 10% 150V
C303	1−102−246−00	s	CERAMIC 47PF 10% 150V
C304	1−102−363−00	s	CERAMIC 0.001 50V
C305	1−102−363−00	s	CERAMIC 0.001 50V
C306	1−102−363−00	s	CERAMIC 0.001 50V
C307	1−102−363−00	s	CERAMIC 0.001 50V
C308	1−102−363−00	s	CERAMIC 0.001 50V
CV1	1−141−316−11	s	TRIMMER
D3	8−719−911−19	s	1SS119
D4	8−719−911−19	s	1SS119
D5	8−719−911−19	s	1SS119
DL1	1−415−243−00	s	1H
DL2	1−415−241−00	s	
FL1	1−235−040−00	s	LPF
FL2	1−231−412−00	s	FILTER BLOCK
IC1	8−759−600−94	s	M51480P
IC2	8−759−600−99	s	M51481P
IC3	8−759−900−00	s	SN74LS00N
IC4	8−759−600−94	s	M51480P
IC5	8−759−201−69	s	TL8608P
IC6	8−759−201−69	s	TL8608P
IC7	8−759−014−96	s	MC1496P
IC8	8−759−951−07	s	SN75107AN
IC9	8−759−910−74	s	SN74S74N
IC10	8−759−345−38	s	HD14538BP
IC11	8−759−240−30	s	TC4030BP
IC12	8−759−900−08	s	SN74LS08N
IC13	8−759−345−38	s	HD14538BP
IC14	8−759−240−24	s	TC4024BP
IC15	8−759−278−08	s	TA78L008AP
IC16	8−759−700−65	s	NJM79L05A
IC17	8−759−178−05	s	μPC78L05
L1	1−407−162−XX	s	MICRO 27
L2	1−407−160−XX	s	MICRO 18
L3	1−407−160−XX	s	MICRO 18
L4	1−407−160−XX	s	MICRO 18
L5	1−407−160−XX	s	MICRO 18
L14	1−407−163−XX	s	MICRO 33
L15	1−407−165−XX	s	MICRO 47
L26	1−407−164−XX	s	MICRO 39
Q1	8−729−603−50	s	2SC403SP
Q2	8−729−201−05	s	2SC2878-B
Q3	8−729−603−50	s	2SC403SP
Q4	8−729−603−50	s	2SC403SP
Q5	8−729−201−05	s	2SC2878-B
Q6	8−729−603−50	s	2SC403SP
Q7	8−729−603−50	s	2SC403SP
Q8	8−729−603−50	s	2SC403SP
Q9	8−729−603−50	s	2SC403SP
Q10	8−729−603−50	s	2SC403SP
Q11	8−729−603−50	s	2SC403SP
Q12	8−729−603−50	s	2SC403SP
Q13	8−729−603−50	s	2SC403SP
Q14	8−729−603−50	s	2SC403SP
Q15	8−729−384−48	s	2SA844
Q16	8−729−201−05	s	2SC2878-B
Q17	8−729−201−05	s	2SC2878-B
Q18	8−729−384−48	s	2SA844
Q19	8−729−603−50	s	2SC403SP
Q20	8−729−603−50	s	2SC403SP
Q21	8−729−603−50	s	2SC403SP
Q22	8−729−603−50	s	2SC403SP
Q23	8−729−603−50	s	2SC403SP
Q24	8−729−603−50	s	2SC403SP
Q25	8−729−603−50	s	2SC403SP
Q26	8−729−603−50	s	2SC403SP
Q27	8−729−603−50	s	2SC403SP
Q28	8−729−603−50	s	2SC403SP
Q29	8−729−384−48	s	2SA844
Q30	8−729−603−50	s	2SC403SP
Q31	8−729−384−48	s	2SA844
Q32	8−729−112−06	s	2SA1206
Q33	8−729−190−12	s	2SC2901
Q34	8−729−603−50	s	2SC403SP
Q35	8−729−603−50	s	2SC403SP

Ref. No.	Parts No.	SP	Description
Q36	8−729−603−50	s	2SC403SP
Q37	8−729−603−50	s	2SC403SP
Q38	8−729−603−50	s	2SC403SP
Q39	8−729−603−50	s	2SC403SP
Q40	8−729−603−50	s	2SC403SP
Q41	8−729−603−50	s	2SC403SP
Q42	8−729−603−50	s	2SC403SP
Q43	8−729−603−50	s	2SC403SP
Q44	8−729−169−02	s	2SC2690A
Q45	8−729−169−02	s	2SC2690A
Q46	8−729−603−50	s	2SC403SP
Q47	8−729−378−84	s	2SD788
Q48	8−729−378−84	s	2SD788
Q49	8−729−374−02	s	2SB740
Q50	8−729−378−84	s	2SD788
Q51	8−729−378−84	s	2SD788
R31	1−215−426−00	s	METAL FILM 1.6K 1% 1/6W
R32	1−215−425−00	s	METAL FILM 1.5K 1% 1/6W
R76	1−215−417−00	s	METAL FILM 680 1% 1/6W
R77	1−215−422−00	s	METAL FILM 1.1K 1% 1/6W
R186	1−244−835−00	s	CARBON 27 5% 1/2W
R187	1−244−835−00	s	CARBON 27 5% 1/2W
RV1	1−224−249−XX	s	VAR, METAL GLAZE 1K
RV2	1−224−251−XX	s	VAR, METAL GLAZE 4.7K
RV3	1−224−249−XX	s	VAR, METAL GLAZE 1K
RV4	1−224−248−XX	s	VAR, METAL GLAZE 470
RV5	1−224−248−XX	s	VAR, METAL GLAZE 470
RV6	1−224−250−XX	s	VAR, METAL GLAZE 2.2K
RV7	1−224−250−XX	s	VAR, METAL GLAZE 2.2K
RV8	1−224−255−XX	s	VAR, METAL GLAZE 100K
RV9	1−224−255−XX	s	VAR, METAL GLAZE 100K
RV10	1−224−250−XX	s	VAR, METAL GLAZE 2.2K
RV11	1−224−249−XX	s	VAR, METAL GLAZE 1K

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Ref. No.	Parts No.	SP	Description
KY-69 BOARD			
	A−6421−047−A	o	MOUNTED CIRCUIT BOARD, KY-69
D1	8−719−919−46	s	GL-9PR2
D2	8−719−919−46	s	GL-9PR2
D3	8−719−919−46	s	GL-9PR2
D4	8−719−919−46	s	GL-9PR2
D5	8−719−919−46	s	GL-9PR2
IC1	8−759−909−49	s	CX23040
SW1	1−554−936−11	s	KEYBOARD
SW2	1−554−936−11	s	KEYBOARD
SW3	1−554−936−11	s	KEYBOARD
SW4	1−554−936−11	s	KEYBOARD
SW5	1−554−936−11	s	KEYBOARD
SW6	1−554−936−11	s	KEYBOARD
SW7	1−554−936−11	s	KEYBOARD
SW8	1−554−936−11	s	KEYBOARD
SW9	1−554−936−11	s	KEYBOARD
SW10	1−554−936−11	s	KEYBOARD
X1	1−527−476−00	s	CERAMIC
AC-49 BOARD			
	A−6421−048−A	o	MOUNTED CIRCUIT BOARD, AC-49
⚠	1−533−037−XX	s	HOLDER, FUSE
⚠ C1	1−136−185−00	s	FILM 0.22 20% 250V
C2	1−136−185−00	s	FILM 0.22 20% 250V
C3	1−136−279−11	s	FILM 0.047 20% 250V
CN5	1−508−904−00	s	6P
CN6	1−508−901−00	o	3P
CN7	1−508−901−00	o	3P
⚠ CN9	1−506−371−00	o	2P
CN10	1−560−437−00	s	4P
CN11	1−508−997−00	o	12P

Ref. No.	Parts No.	SP	Description
D1	8−719−911−19	s	1SS119
D2	8−719−911−19	s	1SS119
⚠ F1	1−532−701−11	s	2.5A
F3	1−532−700−11	s	2.0A
⚠ L1	1−421−259−00	s	LINE FILTER
L2	1−421−604−00	s	CHOKE
L3	1−421−604−00	s	CHOKE
Q1	8−729−606−33	s	2SC2603-F
Q2	8−729−606−33	s	2SC2603-F
Q3	8−729−612−77	s	2SA1027R
Q4	8−729−606−33	s	2SC2603-F

MC-25 BOARD

	A−6421−065−A	o	MOUNTED CIRCUIT BOARD, MC-25
CV1	1−141−316−11	s	TRIMMER
CV2	1−141−316−11	s	TRIMMER
DL1	1−415−402−11	s	DELAY LINE
FL1	1−235−591−11	s	BPF
FL2	1−235−593−11	s	BPF
FL3	1−235−591−11	s	BPF
IC1	8−759−014−96	s	MC1496P
IC2	8−759−014−96	s	MC1496P

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Ref. No.	Parts No.	SP	Description
Q1	8−729−603−50	s	2SC403SP
Q2	8−729−603−50	s	2SC403SP
Q3	8−729−603−50	s	2SC403SP
Q4	8−729−603−50	s	2SC403SP
Q5	8−729−603−50	s	2SC403SP
Q6	8−729−603−50	s	2SC403SP
Q7	8−729−603−50	s	2SC403SP
Q8	8−729−603−50	s	2SC403SP
Q9	8−729−603−50	s	2SC403SP
Q10	8−729−603−50	s	2SC403SP
Q11	8−729−603−50	s	2SC403SP
Q12	8−729−603−50	s	2SC403SP
Q13	8−729−603−50	s	2SC403SP
Q14	8−729−603−50	s	2SC403SP
Q15	8−729−603−50	s	2SC403SP
Q16	8−729−603−50	s	2SC403SP
RV1	1−228−993−00	s	VAR, METAL GLAZE 4.7K
RV2	1−228−991−00	s	VAR, METAL GLAZE 2.2K
RV3	1−228−997−00	s	VAR, METAL GLAZE 100K

DUS-25 BOARD

	1−614−065−11	o	PRINTED CIRCUIT BOARD, DUS-25
CN1	1−508−906−00	o	10P
CN5	1−508−901−00	o	3P
CN6	1−508−904−00	s	6P
D1	8−719−200−02	s	10E-2
D2	8−719−200−02	s	10E-2

DUS-11 BOARD

	1−614−059−12	o	PRINTED CIRCUIT BOARD, DUS-11
CN1	1−508−901−00	o	3P
Q1	8−729−882−52	s	2SB825-R

Ref. No.	Parts No.	SP	Description
DU-75 BOARD			
	1−614−066−11	o	PRINTED CIRCUIT BOARD, DU-75
S1	1−554−936−11	s	KEYBOARD SW "OPEN/CLOSE"
DU-82 BOARD			
	1−614−067−11	o	PRINTED CIRCUIT BOARD, DU-82
PH1	8−719−411−10	s	ON1110
DU-74 BOARD			
	1−614−085−11	o	PRINTED CIRCUIT BOARD, DU-74
PH1	8−719−411−10	s	ON1110
DUS-23 BOARD			
	1−614−057−12	o	PRINTED CIRCUIT BOARD, DUS-23
S1	1−554−932−11	s	PUSH
DUS-13 BOARD			
	1−614−056−11	o	PRINTED CIRCUIT BOARD, DUS-13
CN2	1−562−411−11	s	25P "REMOTE"
S1	1−554−149−00	s	DIP "BAUD RATE"

Ref. No.	Parts No.	SP	Description
DUS-12 BOARD			
	1−517−072−00	s	HOLDER
TM1	1−548−119−21	s	"HOURS METER"
	1−614−070−12	o	PRINTED CIRCUIT BOARD, DUS-12
R2	1−202−730−00		SOLID 8.2M 5% 1/2W
S1	1−516−576−00	s	SLIDE "SC/SYNC"
S2	1−516−576−00	s	SLIDE "LOCAL/REMOTE"
DU-84 BOARD			
	1−614−069−11	o	PRINTED CIRCUIT BOARD, DU-84
J1	1−507−732−00	s	PIN-JACK 2P "LINE OUT"
HP-18 BOARD			
JC1	1−507−553−00	s	JACK "HEADPHONES"
	1−614−071−12	o	PRINTED CIRCUIT BOARD, HP-18
IC1	8−759−900−72	s	NE5532P
R5	1−246−457−00	s	CARBON 220 5% 1/4W
R8	1−246−457−00	s	CARBON 220 5% 1/4W
RV1	1−226−439−00	s	VAR, CARBON 20K "HEADPHONES LEVEL"
DUS-29 BOARD			
	1−614−075−12	o	PRINTED CIRCUIT BOARD, DUS-29
CN3	1−564−824−11	o	20P

Ref. No.	Parts No.	SP	Description
DUS-27 BOARD			
	1−614−060−11	o	PRINTED CIRCUIT BOARD, DUS-27
CN1	1−508−934−00	o	3P
CN2	1−508−934−00	o	3P
⚠ S1	1−554−932−11	s	PUSH "SAFETY"
DUS-28 BOARD			
	1−614−072−11	o	PRINTED CIRCUIT BOARD, DUS-28
CN4	1−508−934−00	o	3P
CN5	1−508−934−00	o	3P
CN6	1−564−825−11	o	40P
SW-87 BOARD			
	1−614−074−11	o	PRINTED CIRCUIT BOARD, SW-87
⚠ F1	1−532−764−11	s	T3.0A
⚠ S1	1−570−102−11	s	PUSH "POWER"

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Ref. No.	Parts No.	SP	Description
SWITCHING REGULATOR UR-12			
⚠	1−413−185−11	s	SWITCHING REGULATOR UR-12
	2−430−448−01	o	RUBBER, RADIATION
	2−430−449−01	o	RUBBER, RADIATION
	2−430−450−01	o	RUBBER, RADIATION
UR-12 A BOARD			
	1−613−948−11	o	A BOARD
	1−564−352−11	o	CONNECTOR PIN, 7P
	1−564−583−11	o	CONNECTOR PIN, 3P
	1−564−605−11	o	CONNECTOR PIN, 4P
C109	1−125−386−00	s	ELECT 470 400V
D101	8−719−911−55	s	U05G
D102	8−719−911−55	s	U05G
D103	8−719−911−55	s	U05G
D104	8−719−911−55	s	U05G
D105	8−719−108−18	s	5P6M
⚠ F101	1−532−604−00	s	126℃ 5A 250V
⚠ R103	1−205−631−00	s	CEMENT 15 5W
UR-12 B BOARD			
	1−613−949−11	o	B BOARD
	1−564−584−11	o	CONNECTOR PIN, 5P
	1−564−605−11	o	CONNECTOR PIN, 4P
C115	1−130−770−00	s	FILM 0.15
C116	1−130−770−00	s	FILM 0.15
D106	8−719−981−01	s	ERA81-004
D107	8−719−815−55	s	1S1555
D108	8−719−981−01	s	ERA81-004
D109	8−719−815−55	s	1S1555
L104	1−421−683−11	s	CHOKE 5.6
L105	1−421−683−11	s	CHOKE 5.6

Ref. No.	Parts No.	SP	Description
Q103	8−729−177−43	s	2SD774
Q104	8−729−177−43	s	2SD774
⚠R104	1−247−080−00	s	CARBON (NONFLAM-MABLE RESISTOR) 5.6 1/4W
R105	1−247−080−00	s	CARBON (NONFLAM-MABLE RESISTOR) 5.6 1/4W
⚠T103	1−437−162−11	s	DRIVE
T104	1−437−162−11	s	DRIVE

UR-12 C BOARD

	1−613−950−11	o	C BOARD
	1−560−741−00	o	CONNECTOR PIN,12P
C251	1−130−504−51	s	FILM 0.001
C252	1−130−504−51	s	FILM 0.001
C253	1−124−263−51	s	ELECT 2.2 50V
C256	1−130−591−11	s	POLYPROPYLENE 3300P 100V
C257	1−130−528−51	s	FILM 0.1
C258	1−130−016−00	s	POLYPROPYLENE 680P 50V
D251	8−719−911−19	s	1SS119
D252	8−719−911−19	s	1SS119
D253	8−719−911−19	s	1SS119
D254	8−719−911−19	s	1SS119
D255	8−719−911−19	s	1SS119
D256	8−719−107−87	s	03P2M
D257	8−719−100−73	s	RD16EB1
D258	8−719−911−19	s	1SS119
IC251	8−759−937−59	s	MB3759
L251	1−408−442−11	s	MICRO 10
Q251	8−729−177−43	s	2SD774
Q252	8−729−177−43	s	2SD774
Q253	8−729−117−54	s	2SA1175

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Ref. No.	Parts No.	SP	Description
⚠R255	1−247−131−11	s	CARBON (NONFLAM-MABLE RESISTOR) 1K 1/4W
RV251	1−230−667−11	s	VAR, SERMET 500

UR-12 D BOARD

	1−613−951−11	o	D BOARD
	1−506−531−11	o	CONNECTOR
	1−543−060−00	s	FERRITE BEAD
D201	8−719−908−00	s	ESAC33-02CS
D202	8−719−901−90	s	ESAC33-02N
D203	8−719−903−16	s	ESAC85-009
D204	8−719−908−00	s	ESAC33-02CS
D205	8−719−901−90	s	ESAC33-02N
Q202	8−729−810−62	s	2SD1061-R
R201	1−246−473−25	s	CARBON 1K 1/4W
R202	1−246−473−25	s	CARBON 1K 1/4W
R203	1−246−473−25	s	CARBON 1K 1/4W
R204	1−246−473−25	s	CARBON 1K 1/4W
R205	1−246−473−25	s	CARBON 1K 1/4W
R206	1−246−473−25	s	CARBON 1K 1/4W

UR-12 E BOARD

	1−613−952−11	o	E BOARD
	1−543−060−00	s	FERRITE BEAD
	1−564−161−11	o	CONNECTOR PIN, 8P
	1−564−352−11	o	CONNECTOR PIN, 7P
C211	1−124−630−51	s	ELECT 1500 25V
C212	1−124−630−51	s	ELECT 1500 25V
C213	1−123−334−00	s	ELECT 220 25V
C214	1−123−334−00	s	ELECT 220 25V
C215	1−123−334−00	s	ELECT 220 25V
C216	1−123−334−00	s	ELECT 220 25V
C227	1−130−528−51	s	FILM 0.1
C228	1−124−162−00	s	ELECT 47 10V
D208	8−719−100−86	s	RD22EB2
D209	8−719−100−86	s	RD22EB2

Ref. No.	Parts No.	SP	Description
L204	1−421−459−00	s	CHOKE
L205	1−421−459−00	s	CHOKE

UR-12 M BOARD

	1−613−947−11	o	M BOARD
⚠ C101	1−136−212−00	s	FILM 0.1 250V
C102	1−136−185−00	s	FILM 0.22 250V
C103	1−162−168−00	s	SERAMIC 3300P
C104	1−162−168−00	s	SERAMIC 3300P
C105	1−162−168−00	s	SERAMIC 3300P
C106	1−162−168−00	s	SERAMIC 3300P
C110	1−123−659−00	s	ELECT 4.7 250V
C111	1−123−659−00	s	ELECT 4.7 250V
C113	1−130−768−00	s	FILM 0.1
C114	1−130−808−00	s	FILM 0.22
C205	1−124−523−51	s	ELECT 4700 16V
C207	1−124−523−51	s	ELECT 4700 16V
C209	1−124−520−51	s	ELECT 3300 10V
C210	1−123−299−00	s	1000
C217	1−130−528−51	s	FILM 0.1
C218	1−130−512−00	s	FILM 0.0047
C219	1−130−520−51	s	FILM 0.022
C220	1−130−528−51	s	FILM 0.1
C221	1−130−508−00	s	FILM 0.0022
C222	1−130−508−00	s	FILM 0.0022
C223	1−161−925−00	s	100P 500V
C225	1−130−516−51	s	0.01
⚠ CN101	1−560−437−00	o	CONNECTOR PIN, 4P
CN201	1−560−315−00	o	CONNECTOR
	1−562−980−11	o	CONNECTOR
D110	8−719−104−07	s	F114F
D111	8−719−104−07	s	F114F
D112	8−719−911−19	s	1SS119
D206	8−719−200−02	s	10E-2
D207	8−719−104−07	s	F114F
D210	8−719−911−19	s	1SS119
D211	8−719−911−19	s	1SS119
D212	8−719−100−56	s	RD10EB1
D213	8−719−100−34	s	RD5.6EB1
D214	8−719−911−19	s	1SS119

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Ref. No.	Parts No.	SP	Description
D215	8−719−911−19	s	1SS119
D216	8−719−100−70	s	RD15EB1
D217	8−719−911−19	s	1SS119
IC101	1−806−805−11	s	MC5433
IC201	8−759−135−80	s	μPC358C
⚠ L101	1−421−259−00	s	LINE FILTER
L201	1−421−686−11	s	CHOKE
L202	1−421−685−11	s	CHOKE
L203	1−421−684−11	s	CHOKE
L206	1−421−459−00	s	CHOKE
L207	1−421−459−00	s	CHOKE
L208	1−421−459−00	s	CHOKE
Q101	8−729−300−50	s	2SC2307
Q102	8−729−300−50	s	2SC2307
Q201	8−729−102−03	s	2SD1020
Q203	8−729−117−54	s	2SA1175
Q204	8−729−178−54	s	2SC2785
Q205	8−729−178−54	s	2SC2785
R101	1−247−099−11	s	CARBON (NONFLAMMABLE RESISTOR) 47 1/4W
R102	1−246−457−00	s	CARBON (NONFLAMMABLE RESISTOR) 220 1/4W
⚠ R213	1−247−109−00	s	CARBON (NONFLAMMABLE RESISTOR) 120 1/4W
R214	1−205−623−00	s	CEMENT (NONFLAMMABLE RESISTOR) 47 5W
R215	1−205−623−00	s	CEMENT (NONFLAMMABLE RESISTOR) 47 5W
R221	1−247−081−00	s	CARBON (NONFLAMMABLE RESISTOR) 6.8 1/4W
R222	1−246−461−25	s	CARBON 330 1/4W
R223	1−246−461−25	s	CARBON 330 1/4W
RV201	1−230−667−11	s	VAR, SERMET 500
RV202	1−230−668−11	s	VAR, SERMET 1K
⚠ T101	1−447−937−11	s	CONVERTER
T102	1−421−572−11	s	CURRENT
T105	1−447−952−11	s	STARTER
T106	1−447−938−11	s	PULSE

Ref. No.	Parts No.	SP	Description
RF BOARD (OPTICAL BLOCK ASS'Y)			
⚠	A-4915-010-A	o	MOUNTED CIRCUIT BOARD, RF
C1	1-123-617-00	s	ELECT 10 20% 16V
C2	1-163-033-00	s	CERAMIC CHIP 0.022 10% 25V
C3	1-123-821-00	s	ELECT 47 20% 16V
C4	1-163-033-00	s	CERAMIC CHIP 0.022 10% 25V
C5	1-163-033-00	s	CERAMIC CHIP 0.022 10% 25V
C6	1-163-033-00	s	CERAMIC CHIP 0.022 10% 25V
C7	1-163-033-00	s	CERAMIC CHIP 0.022 10% 25V
C8	1-163-129-00	s	CERAMIC CHIP 330P 5% 50V
C9	1-163-129-00	s	CERAMIC CHIP 330P 5% 50V
C10	1-163-129-00	s	CERAMIC CHIP 330P 5% 50V
C11	1-163-129-00	s	CERAMIC CHIP 330P 5% 50V
C12	1-163-109-00	s	CERAMIC CHIP 47P 5% 50V
C13	1-163-109-00	s	CERAMIC CHIP 47P 5% 50V
C14	1-163-109-00	s	CERAMIC CHIP 47P 5% 50V
C15	1-163-109-00	s	CERAMIC CHIP 47P 5% 50V
C16	1-163-109-00	s	CERAMIC CHIP 47P 5% 50V
C17	1-163-109-00	s	CERAMIC CHIP 47P 5% 50V
C18	1-163-038-00	s	CERAMIC CHIP 0.1 25V
Q1	8-729-102-28	s	2SC2223
Q2	8-729-102-28	s	2SC2223
R1	1-216-073-00	s	CHIP 10K 5%
R2	1-216-073-00	s	CHIP 10K 5%
R3	1-216-053-00	s	CHIP 1.5K 5%
R4	1-216-025-00	s	CHIP 100 5%
R5	1-216-073-91	s	CHIP 10K 5%
R6	1-216-051-00	s	CHIP 1.2K 5%
R7	1-216-069-00	s	CHIP 6.8K 5%
R8	1-216-041-00	s	CHIP 470 5%
R9	1-216-041-00	s	CHIP 470 5%
R10	1-216-021-00	s	CHIP 68 5%
R12	1-216-065-00	s	CHIP 4.7K 5%
R13	1-216-065-00	s	CHIP 4.7K 5%
R14	1-216-065-00	s	CHIP 4.7K 5%
R15	1-216-073-00	s	CHIP 10K 5%
R16	1-216-073-00	s	CHIP 10K 5%
FRAME			
⚠	8-848-021-01	s	OPTICAL BLOCK ASSY (KSS-140A)
	X-2640-731-1	s	SKEW SENSOR ASSY
	A-4915-010-A	s	COMPLETE PCB, RF
	X-2640-707-1	s	SKEW DRIVE ASSY
⚠	1-413-185-11	s	SWITCHING REGULATOR (UR-12)
	1-464-423-21	s	UNIT, COLOR RF
	1-464-437-11	s	RECEIVER, REMOTE CONTROL
⚠	1-509-841-00	s	OUTLET, AC "AC OUT"
	1-534-517-00	s	CORD, AC
	1-614-077-11	s	FLEXIBLE PCB, FL-25
CN1	1-561-781-21	s	RECEPTACLE, BNC "VIDEO OUT"
CN2	1-561-671-00	s	RECEPTACLE, 8P "TV"
	1-560-553-00	s	CONTACT
CN3	1-561-781-21	s	RECEPTACLE, BNC "SYNC IN"
J2	1-507-195-21	s	SPECIAL JACK "REMOTE"
J3	1-507-195-21	s	SPECIAL JACK "LOCK PULSE"
M1	X-3705-058-1	s	MOTOR ASSY, SLIDE
M2	8-838-084-01	s	MOTOR ASSY, (BHF-1700B) SPINDLE
M3	8-835-055-01	s	MOTOR, DC (DNR-4700A) LOADING
PM1	1-454-274-22	s	SOLENOID, BRAKE
RV1	1-230-675-11	s	POTENTIOMETER

The shaded and ⚠ -marked components are critical to safety.
Replace only with same components as specified.

8-4. PACKING MATERIAL AND ACCESSORY (SUPPLIED)

Ref. No.	Parts No.	SP	Description
	1−534−763−00	s	COAXIAL CABLE
	1−506−305−00	s	PLUG, F
	3−654−748−00	o	SPACER
	3−688−351−01	o	CUSHION, UPPER
	3−688−352−01	o	CUSHION, LOWER
	3−688−353−01	o	CARTON, INDIVIDUAL
	3−701−630−00	s	BAG, POLY
⚠	3−760−287−22	s	MANUAL, INSTRUCTION
	3−795−581−21	s	INSTRUCTION
	4−323−658−01	o	SHEET, PROTECTION

The shaded and ⚠ -marked components are critical to safety.
Replace only with same components as specified.

Lasermax
VIDEODISC PLAYER

LDP-2000

SUPPLEMENT-2R

Please file this SUPPLEMENT-2R to your MANUAL.

The circuits and the boards from the SER. NO. 31,051 were changed. Also, the supplement and the mistakes of the parts list are described in the SUPPLEMENT-2R.

- Contents of changes
  - DM-45 board (The circuit and the pattern are changed.)
  - MC-25 board (The circuit and the pattern are changed.)
  - SV-69 board (The circuit and the pattern are changed. The SG-102 and the SG-103 boards are abolished.)
  - SA-16 board (The circuit and the pattern are changed.)
  - SV-59 board (The pattern is changed.)

LDP-2000 (UC)
9-966-803-83

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1986. 3 11

CHANGE INFORMATION OF EACH BOARD

DM-45 BOARD

Ref. No.	Up to Serial No. 31050	Serial No. 31051 and Higher	Note
	MOUNTED CIRCUIT BOARD, DM-45 A-6421-046-A	A-6421-046-B	Changed
C6	CERAMIC 270PF	SILVERED MICA 8.2PF 500V (1-107-049-00)	Changed
C12	CERAMIC 180PF	MYLAR 0.022μF 25V (1-161-055-00)	Changed
C50	ELECT 47μF 16V	ELECT (NONPOLAR) 47μF 16V (1-124-631-11)	Changed
C120	CERAMIC 150PF	SILVERED MICA 36PF 50V (1-107-074-00)	Disused
C146	———	ELECT 10μF 16V (1-123-617-00)	Added
C161	SILVERED MICA 47PF	———	Disused
C162	CERAMIC 470PF	———	Disused
C163	MYLAR 0.0022μF	———	Disused
C164	SILVERED MICA 47PF	———	Disused
C165	MYLAR 0.0033μF	———	Disused
C198	———	CERAMIC 0.01μF 25V (1-616-051-00)	Added
C199	———	CERAMIC 0.022μF 25V (1-161-055-00)	Added
CN9	———	10P (1-564-009-11)	Added
D5	1SS119	———	Disused
IC10	HD14538BP	———	Disused
IC11	TC4030BP	———	Disused
IC13	HD14538BP	———	Disused
IC14	TC4024BP	———	Disused
Q52	———	2SC403SP (8-729-603-50)	Added
R69	CARBON 100K 1/6W	CARBON 22K 1/6W (1-247-863-00)	Changed
R196	CARBON 100K 1/6W	———	Disused
R197	CARBON 4.7K 1/6W	———	Disused
R198	CARBON 100K 1/6W	———	Disused
R199	CARBON 4.7K 1/6W	———	Disused
R200	CARBON 47K 1/6W	———	Disused
R201	CARBON 100K 1/6W	———	Disused
R202	CARBON 100K 1/6W	———	Disused
R203	CARBON 4.7K 1/6W	———	Disused
R204	CARBON 100K 1/6W	———	Disused
R205	CARBON 100K 1/6W	———	Disused

Ref. No.	Up to Serial No. 31050	Serial No. 31051 and Higher	Note
R206	CARBON 100K 1/6W	———	Disused
R207	CARBON 100K 1/6W	———	Disused
R208	CARBON 100K 1/6W	———	Disused
R224	———	CARBON 1K 1/6W (1-247-831-00)	Added
R225	———	CARBON 68 1/6W (1-247-803-00)	Added

MC-25 BOARD

C9	CERAMIC 0.047μF	———	Disused
C11	CERAMIC 0.022μF	ELECT 47μF 6.3V (1-123-647-00)	Changed
C26	CERAMIC 0.02μF	———	Disused
DL1	DELAY LINE	———	Disused
Q10	2SC403SP	———	Disused
R25	CARBON 470 1/6W	CARBON 47K 1/6W (1-247-871-00)	Changed
R26	CARBON 1K 1/6W	CARBON 18K 1/6W (1-247-861-00)	Changed
R27	CARBON 2.2 K 1/6W	CARBON 820 1/6W (1-247-829-00)	Changed
R28	CARBON 6.8K 1/6W	CARBON 1K 1/6W (1-247-831-00)	Changed
R29	CARBON 1K 1/6W	———	Disused
R35	CARBON 10K 1/6W	———	Disused
R37	CARBON 6.8K 1/6W	CARBON 4.7K 1/6W (1-247-847-00)	Changed
R58	CARBON 3.9K 1/6W	———	Disused
RV1	VAR, METAL GLAZE 4.7K	VAR, METAL GLAZE 47K (1-228-996-00)	Changed
RV2	VAR, METAL GLAZE 2.2K	———	Disused
RV3	VAR, METAL GLAZE 100K	VAR, METAL GLAZE 4.7K (1-228-993-00)	Changed

SA-16 BOARD

C32	CERAMIC 0.022μF	CERAMIC 0.047μF 25V (1-161-059-00)	Changed
C46	CERAMIC 0.022μF	CERAMIC 0.047μF 25V (1-161-059-00)	Changed
C100	———	CERAMIC 0.047μF 25V (1-161-059-00)	Added
C210	———	ELECT (NONPOLAR) 0.47μF 50V (1-124-270-11)	Added
FL1	BPF 1-235-039-11	BPF (1-235-591-21)	Changed
FL2	BPF 1-235-038-11	BPF (1-235-592-21)	Changed

Ref. No.	Up to Serial No. 31050	Serial No. 31051 and Higher	Note
L8	MICRO 4.7μH	———	Disused
Q15	———	2SC2458 (8-729-245-83)	Added
R16	CARBON 15 1/6W	CARBON 33 1/6W (1-247-795-00)	Changed
R19	CARBON 820 1/6W	CARBON 1K 1/6W (1-247-831-00)	Changed
R37	CARBON 820 1/6W	CARBON 1K 1/6W (1-247-831-00)	Changed
R134	CARBON 47K 1/6W	———	Disused
R140	———	CARBON 470 1/6W (1-247-823-00)	Added

SG-102 BOARD

	PRINTED CIRCUIT BOARD, SG-102	———	Disused

SG-103 BOARD

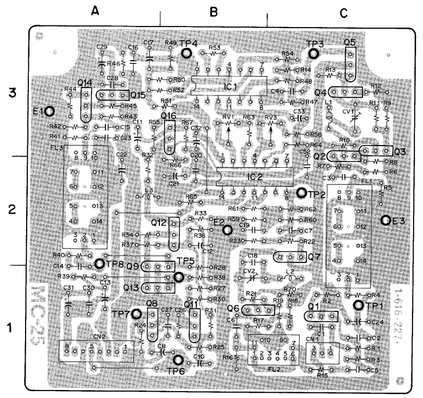
	PRINTED CIRCUIT BOARD, SG-103	———	Disused

SV-69 BOARD

	MOUNTED CIRCUIT BOARD, SV-69 A-6421-044-A	A-6421-044-B	Changed
C401	———	ELECT 10μF 16V (1-123-617-11)	Added
C402	———	CERAMIC 0.01μF 25V (1-161-013-00)	Added
C701	SILVERED MICA 47PF	SILVERED MICA 30PF 500V (1-107-158-00)	Changed
C703	SILVERED MICA 100P	———	Disused
C706	MYLAR 0.1μF	ELECT 47μF 16V (1-123-821-11)	Changed
C707	ELECT 47μF 10V	———	
C708	———	CERAMIC 0.022μF 25V (1-161-055-00)	Added
C709	———	CERAMIC 470PF 50V (1-102-114-00)	Added
C710	———	CERAMIC 0.022μF 25V (1-161-055-00)	Added
CN8	———	6P (1-564-005-00)	Added
CN701	6P	———	Disused
CN702	8P	———	Disused
D701	———	1SS119 (8-719-911-19)	Added
D702	———	1SS119 (8-719-911-19)	Added

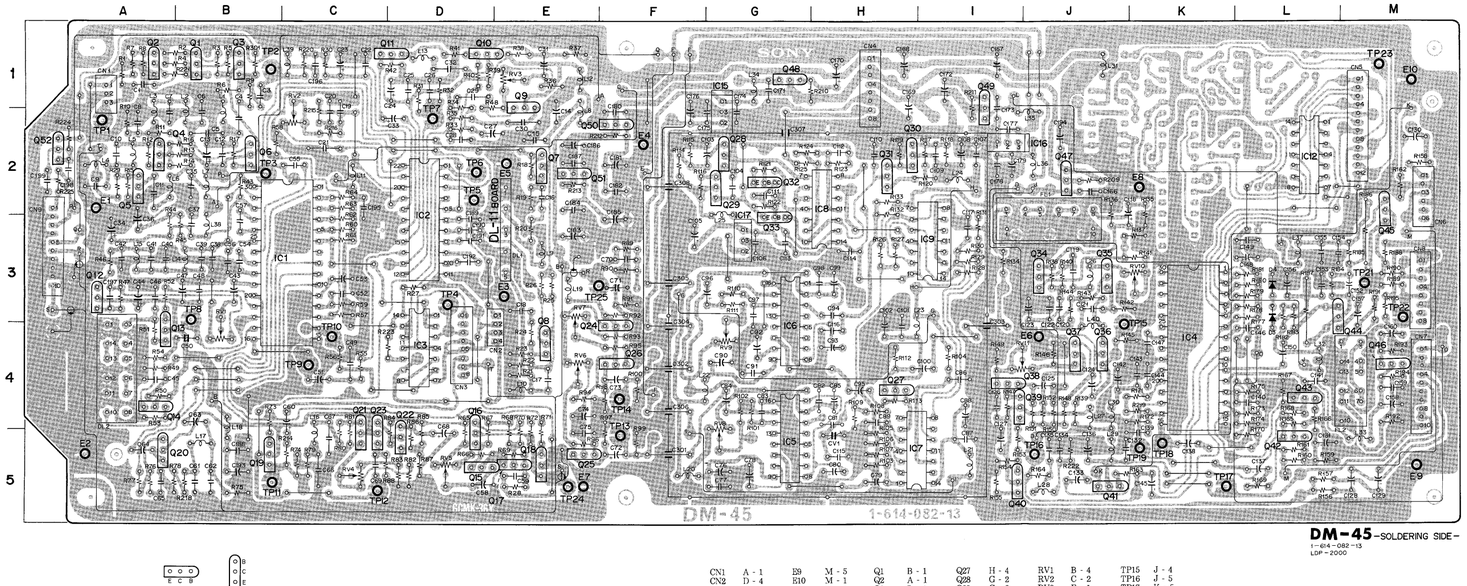
Ref. No.	Up to Serial No. 31050	Serial No. 31051 and Higher	Note
IC9	TC40H004P	———	Disused
IC701	SN74LS221N	TC4528BP (8-759-245-28)	Changed
IC702	SN74LS00N	TC40H000P (8-759-220-00)	Changed
L701	———	MICRO 10μH (1-408-409-00)	Added
Q702	———	2SC403SP (8-729-603-40)	Added
R602	CARBON 1K 1/6W	CARBON 1.5K 1/6W (1-247-835-00)	Changed
R604	CARBON 3.9K 1/6W	CARBON 3.3K 1/6W (1-247-843-00)	Changed
R701	CARBON 100K 1/6W	———	Disused
R702	CARBON 100K 1/6W	CARBON 10K 1/6W (1-247-855-00)	Changed
R703	CARBON 100K 1/6W	———	Disused
R704	CARBON 100K 1/6W	———	Disused
R705	CARBON 100K 1/6W	———	Disused
R706	CARBON 47K 1/6W	———	Disused
R707	CARBON 100K 1/6W	———	Disused
R712	CARBON 2.2K 1/6W	CARBON 4.7K 1/6W (1-247-847-00)	Changed
R713	CARBON 1K 1/6W	CARBON 820 1/6W (1-247-829-00)	Changed
R716	———	CARBON 10K 1/6W (1-247-855-00)	Added
R717	———	CARBON 1K 1/6W (1-247-831-00)	Added
R718	———	CARBON 1K 1/6W (1-247-831-00)	Added
R719	———	CARBON 68 1/6W (1-247-803-00)	Added
R720	———	CARBON 100K 1/6W (1-247-879-00)	Added
R721	———	CARBON 4.7K 1/6W (1-247-847-00)	Added
R722	———	CARBON 560 1/6W (1-247-825-00)	Added

DM-45 (VIDEO DEMODULATOR)
DL-11
MC-25 (NOISE CANCELLER)



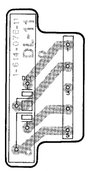
MC-25-SOLDERING SIDE-
1-616-227-13
LDP-2000

CN1	C - 1	TP1	C - 1
CN2	A - 1	TP2	C - 2
		TP3	C - 3
CV1	C - 3	TP4	B - 3
CV2	B - 1	TP5	B - 1
		TP6	B - 1
E1	A - 3	TP7	A - 1
E2	B - 2	TP8	A - 2
E3	C - 2		
FL1	C - 2		
FL2	C - 1		
FL3	A - 2		
IC1	B - 3		
IC2	B - 2		
Q1	C - 1		
Q2	C - 3		
Q3	C - 3		
Q4	C - 3		
Q5	C - 3		
Q6	B - 1		
Q7	C - 2		
Q8	A - 1		
Q9	A - 1		
Q11	B - 1		
Q12	B - 2		
Q13	A - 1		
Q14	A - 3		
Q15	A - 3		
Q16	B - 3		
RV1	B - 3		
RV3	C - 3		



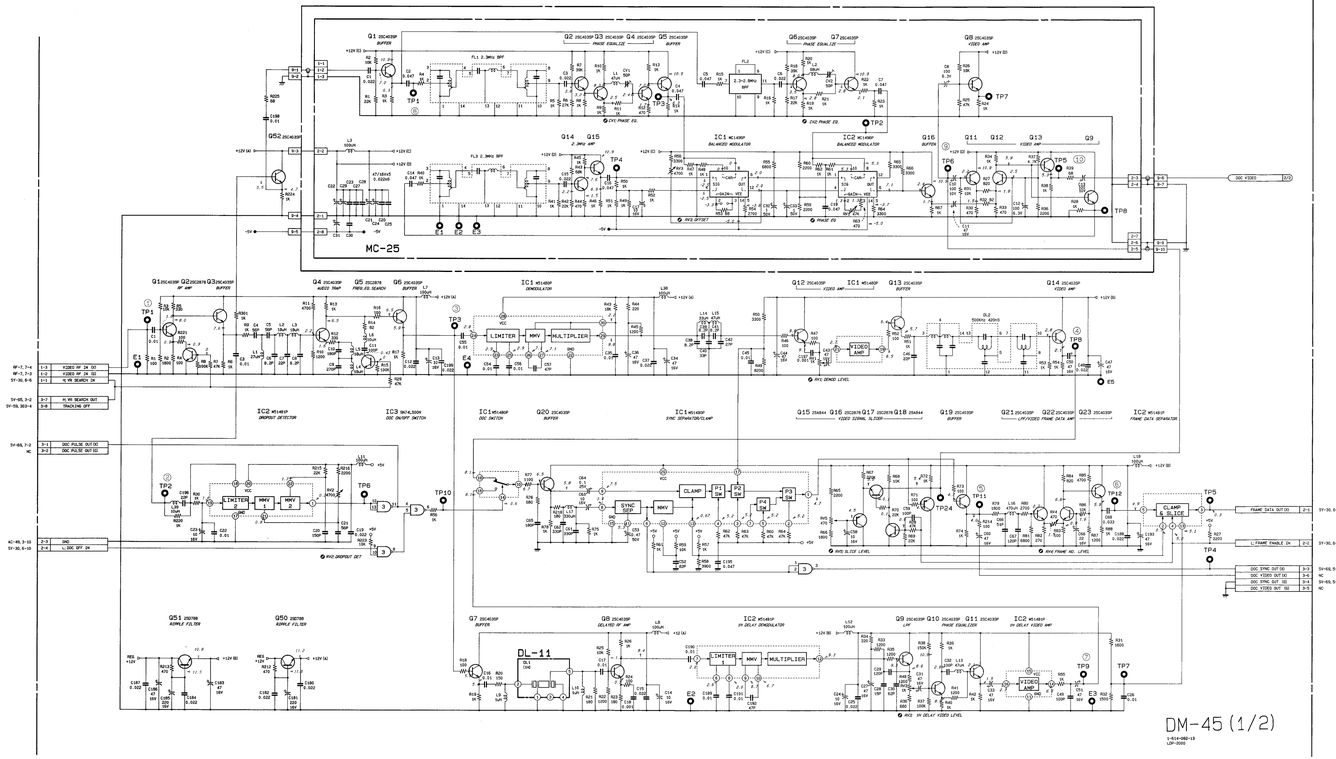
DM-45-SOLDERING SIDE-
1-614-082-13
LDP-2000

CN1	A - 1	E9	M - 5	Q1	B - 1	Q27	H - 4	RV1	B - 4	TP15	J - 4
CN2	D - 4	E10	M - 1	Q2	A - 1	Q28	G - 2	RV2	C - 2	TP16	J - 5
CN3	D - 4			Q3	B - 1	Q29	G - 2	RV3	E - 1	TP17	K - 5
CN4	H - 1	FL1	J - 2	Q4	A - 2	Q30	H - 2	RV4	C - 5	TP18	K - 5
CN5	M - 2	FL2	M - 4	Q5	A - 2	Q31	H - 2	RV5	D - 5	TP19	K - 5
CN6	M - 2			Q6	B - 2	Q32	G - 2	RV6	E - 4	TP21	M - 3
CN7	M - 4	IC1	C - 3	Q7	E - 2	Q33	G - 3	RV7	E - 3	TP22	M - 3
CN8	M - 3	IC2	D - 2	Q8	E - 4	Q34	J - 3	RV8	G - 5	TP23	M - 1
CN9	A - 3	IC3	D - 4	Q9	E - 2	Q35	J - 3	RV9	G - 4	TP24	E - 5
		IC4	K - 4	Q10	D - 1	Q36	J - 4	RV10	K - 3	TP25	F - 3
CV1	H - 5	IC5	G - 5	Q11	D - 1	Q37	J - 4	RV11	J - 4		
		IC6	G - 3	Q12	A - 3	Q38	I - 4				
D3	L - 3	IC7	I - 5	Q13	A - 4	Q39	J - 4	TP1	A - 2		
D4	L - 3	IC8	H - 2	Q14	A - 4	Q40	I - 5	TP2	B - 1		
		IC9	I - 3	Q15	D - 5	Q41	J - 5	TP3	B - 2		
DL1	E - 2	IC12	L - 2	Q16	D - 4	Q42	L - 5	TP4	D - 3		
DL2	A - 4	IC15	G - 1	Q17	E - 5	Q43	L - 4	TP5	D - 2		
		IC16	I - 2	Q18	E - 5	Q44	L - 5	TP6	D - 2		
E1	A - 2	IC17	G - 3	Q19	B - 5	Q45	M - 2	TP7	D - 2		
E2	A - 5			Q20	A - 5	Q46	M - 4	TP8	B - 3		
E3	E - 3			Q21	C - 4	Q47	J - 2	TP9	C - 4		
E4	F - 2			Q22	C - 5	Q48	G - 1	TP10	C - 4		
E5	E - 2			Q23	C - 4	Q49	I - 1	TP11	B - 5		
E6	J - 4			Q24	F - 4	Q50	F - 2	TP12	C - 5		
E7	E - 5			Q25	E - 5	Q51	E - 2	TP13	F - 5		
E8	K - 2			Q26	F - 4	Q52	A - 2	TP14	F - 4		



DL-11-SOLDERING SIDE-
1-614-076-11
LDP-2000

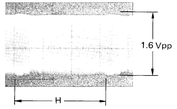
DM-45 (VIDEO DEMODULATOR)
DL-11
MC-25 (NOISE CANCELLER)



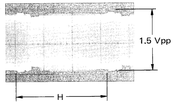
DM-45, DL-11, MC-25 DM-45, DL-11, MC-25

① TP1

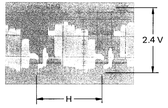
② TP2



③ TP3

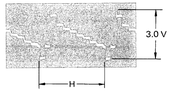


④ TP8

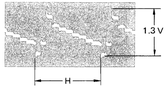


⑤ TP11

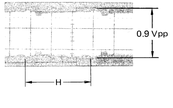
⑥ TP12



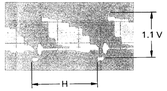
⑦ TP9



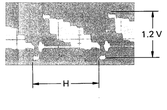
⑧ TP1



⑨ TP5

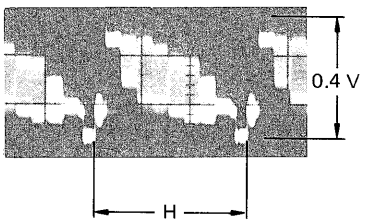


⑩ TP6

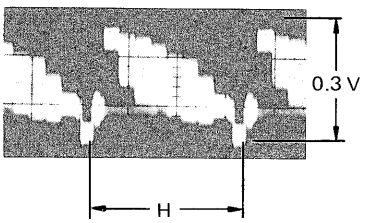


DM-45 (VIDEO TBC)

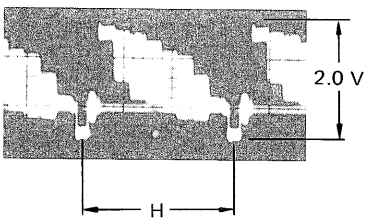
⑪ **TP13**



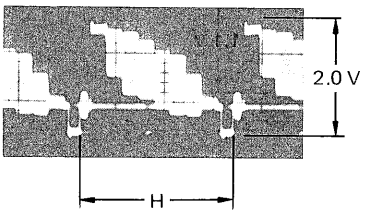
⑫ **TP15**



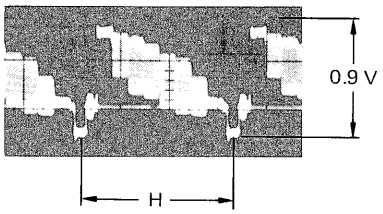
⑬ **TP16**

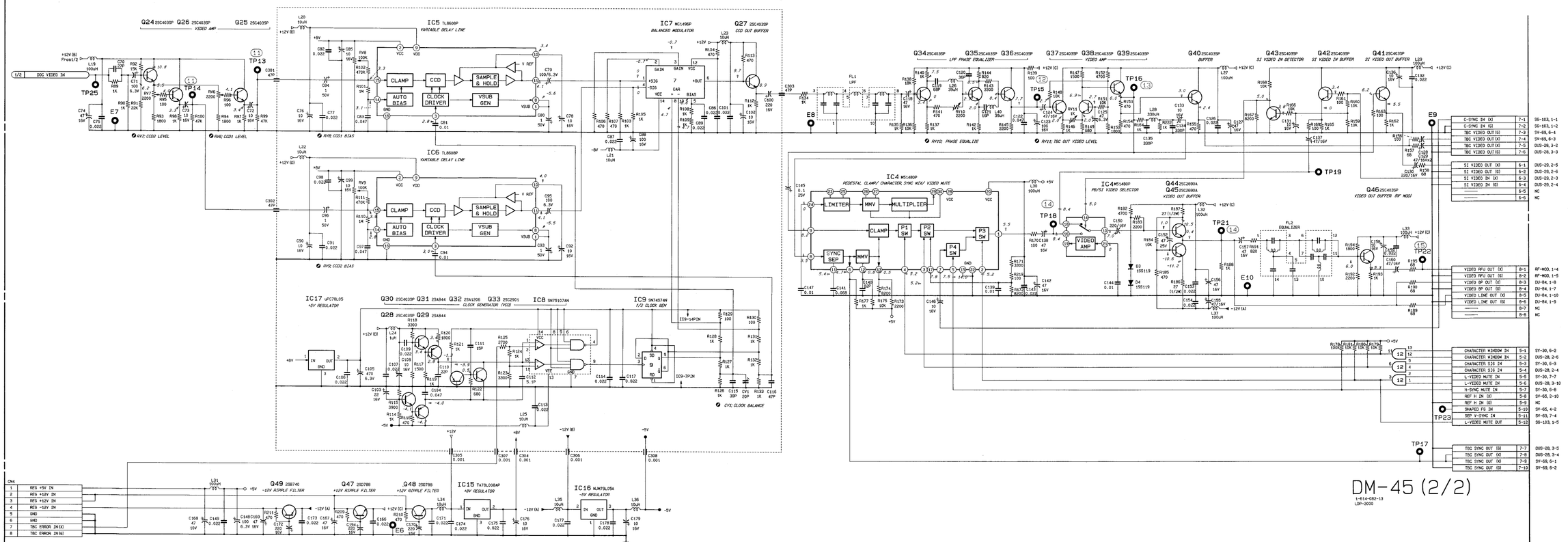


⑭ **TP18**
TP21



⑮ **TP22**

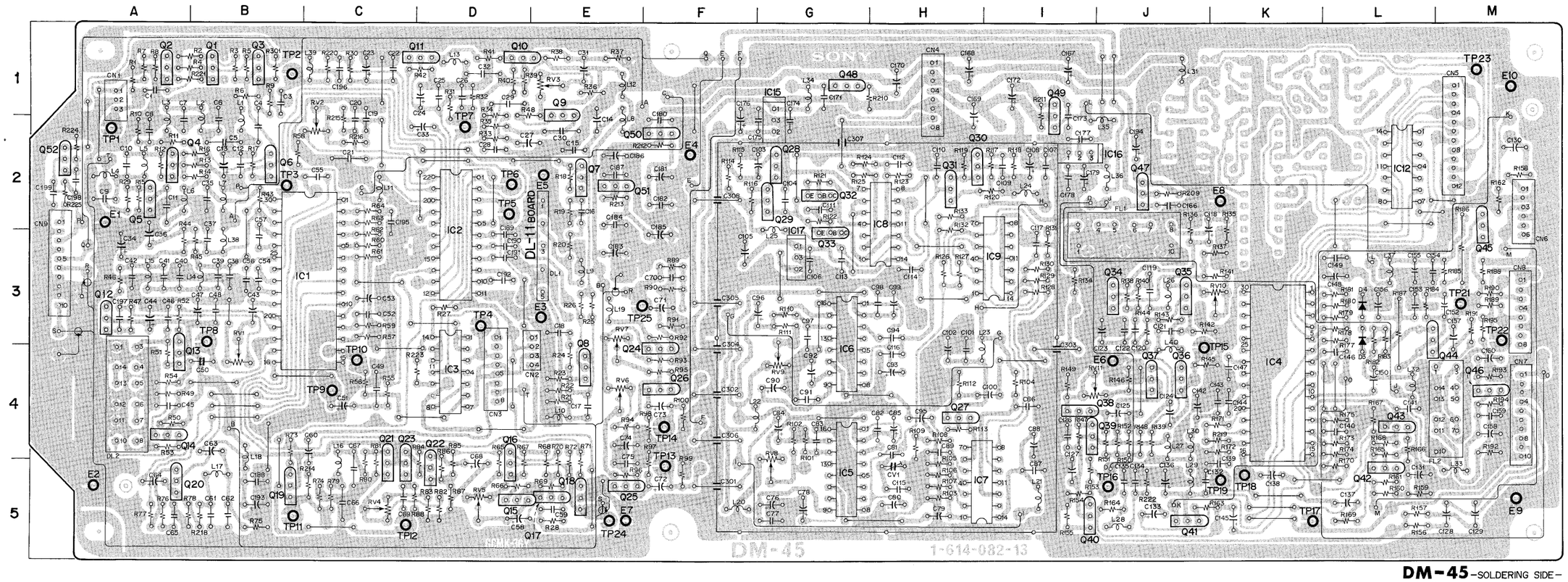



IC5 TL8608P VARIABLE DELAY LINE
IC6 TL8608P VARIABLE DELAY LINE
IC7 MC1496P BALANCED MODULATOR
IC4 M51480P PEDESTAL CLAMP/ CHARACTER SYNC MIX/ VIDEO MUTE
IC8 SN75107AN
IC9 SN74S74N Y/C CLOCK GEN
IC15 TA78L08AP +8V REGULATOR
IC16 NJM79L05A -5V REGULATOR
IC17 μPC78L05 +5V REGULATION
CLAMP
CCD DRIVER
AUTO BIAS
SAMPLE & HOLD
VSUB GEN
LIMITER
MMV
MULTIPLIER
SYNC SEP
P1 SW
P2 SW
P3 SW
P4 SW
VIDEO AMP
Q24 2SC4033P Q26 2SC4033P VIDEO AMP
Q25 2SC4033P
Q27 2SC4033P CCD OUT BUFFER
Q34 2SC4033P Q35 2SC4033P Q36 2SC4033P LPF PHASE EQUALIZER
Q37 2SC4033P Q38 2SC4033P Q39 2SC4033P VIDEO AMP
Q40 2SC4033P BUFFER
Q43 2SC4033P S1 VIDEO IN DETECTOR
Q42 2SC4033P S1 VIDEO IN BUFFER
Q41 2SC4033P S1 VIDEO OUT BUFFER
Q44 2SC2690A Q45 2SC2690A VIDEO OUT BUFFER
Q46 2SC4033P VIDEO OUT BUFFER RF MOD
Q30 2SC4033P Q31 2SA844 Q32 2SA1206 Q33 2SC2901 CLOCK GENERATOR VCO
Q28 2SC4033P Q29 2SA844
Q49 2SB740 +12V RIPPLE FILTER
Q47 2SD788 +12V RIPPLE FILTER
Q48 2SD788 +8V RIPPLE FILTER
FL1 LPF
FL2 EQUALIZER
D3 1SS119
D4 1SS119
TP13
TP14
TP15
TP16
TP17
TP18
TP19
TP21
TP22
TP23
TP25
E6
E7
E8
E9
E10
DDG VIDEO IN
R/Y2: CCD2 LEVEL
R/Y3: CCD1 LEVEL
R/Y4: CCD1 BIAS
R/Y5: CCD2 BIAS
R/Y10: PHASE EQUALIZE
R/Y11: TBC OUT VIDEO LEVEL
C/Y1: CLOCK BALANCE
IC9-14PIN
IC9-7PIN
C-SYNC IN (X) 7-1 SY-103, 1-1
C-SYNC IN (G) 7-2 SY-103, 1-2
TBC VIDEO OUT (G) 7-3 SY-69, 6-4
TBC VIDEO OUT (X) 7-4 SY-69, 6-3
TBC VIDEO OUT (X) 7-5 DUS-28, 3-2
TBC VIDEO OUT (G) 7-6 DUS-28, 3-3
S1 VIDEO OUT (X) 6-1 DUS-29, 2-5
S1 VIDEO OUT (G) 6-2 DUS-29, 2-6
S1 VIDEO IN (X) 6-3 DUS-29, 2-3
S1 VIDEO IN (G) 6-4 DUS-29, 2-4
6-5 NC
6-6 NC
VIDEO RPU OUT (X) 8-1 RF-MOD, 1-4
VIDEO RPU OUT (G) 8-2 RF-MOD, 1-5
VIDEO BP OUT (X) 8-3 DU-84, 1-8
VIDEO BP OUT (G) 8-4 DU-84, 1-7
VIDEO LINE OUT (X) 8-5 DU-84, 1-10
VIDEO LINE OUT (G) 8-6 DU-84, 1-9
8-7 NC
8-8 NC
CHARACTER WINDOW IN 5-1 SY-30, 6-2
CHARACTER WINDOW IN 5-2 DUS-28, 2-6
CHARACTER SIG IN 5-3 SY-30, 6-3
CHARACTER SIG IN 5-4 DUS-28, 2-4
L-VIDEO MUTE IN 5-5 SY-30, 7-7
L-VIDEO MUTE IN 5-6 DUS-28, 3-10
H-SYNC MUTE IN 5-7 SY-30, 8-8
REF H IN (X) 5-8 SY-65, 2-10
REF H IN (G) 5-9 NC
SHAPED FG IN 5-10 SY-65, 4-2
SEP V-SYNC IN 5-11 SY-65, 7-4
L-VIDEO MUTE OUT 5-12 SY-103, 1-5
TBC SYNC OUT (G) 7-7 DUS-28, 3-5
TBC SYNC OUT (X) 7-8 DUS-28, 3-4
TBC SYNC OUT (X) 7-9 SY-69, 6-1
TBC SYNC OUT (G) 7-10 SY-69, 6-2
CN4
1 REG +5V IN AC-49, 2-2
2 REG +12V IN AC-49, 1-2
3 REG +12V IN NC
4 REG -12V IN AC-49, 4-2
5 GND NC
6 GND AC-49, 3-2
7 TBC ERROR IN(X) SY-69, 2-1
8 TBC ERROR IN(G) SY-69, 2-2

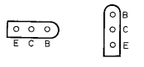
DM-45 (2/2)

1-614-082-13
LDP-2000

DM-45 (VIDEO TBC)

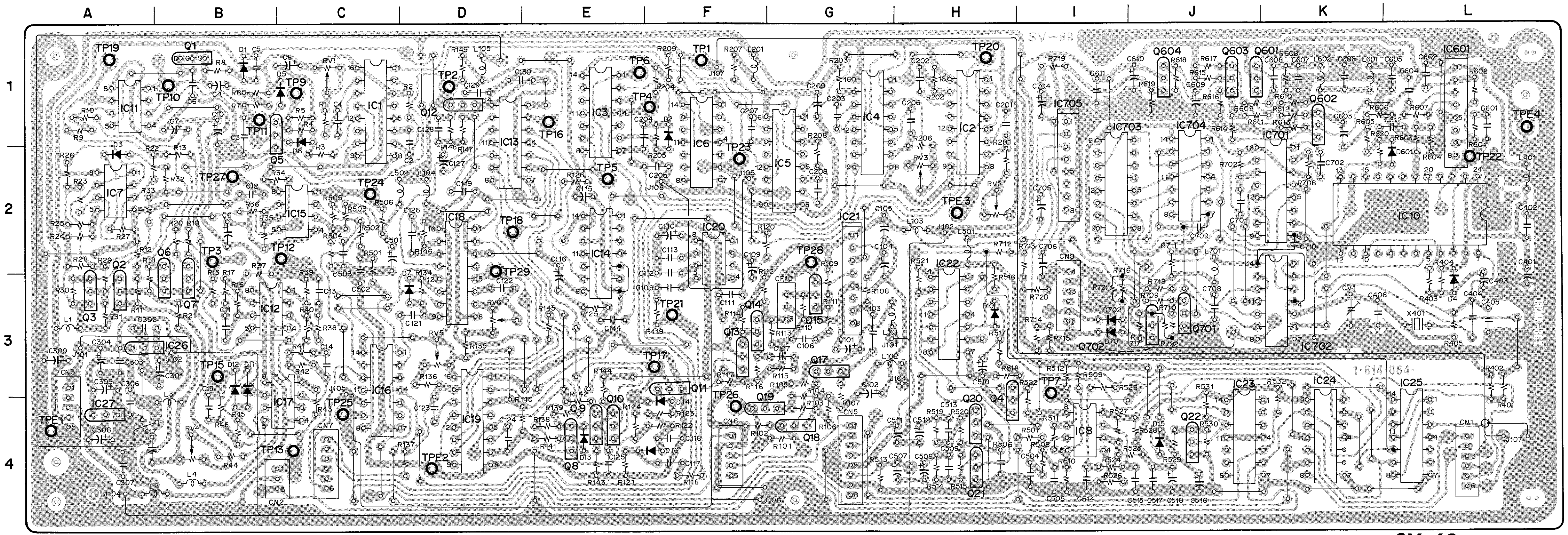


DM-45 –SOLDERING SIDE–
1-614-082-13
LDP-2000

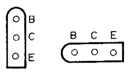


CN1	A - 1	E9	M - 5	Q1	B - 1	Q27	H - 4	RV1	B - 4	TP15	J - 4
CN2	D - 4	E10	M - 1	Q2	A - 1	Q28	G - 2	RV2	C - 2	TP16	J - 5
CN3	D - 4			Q3	B - 1	Q29	G - 2	RV3	E - 1	TP17	K - 5
CN4	H - 1	FL1	J - 2	Q4	A - 2	Q30	H - 2	RV4	C - 5	TP18	K - 5
CN5	M - 2	FL2	M - 4	Q5	A - 2	Q31	H - 2	RV5	D - 5	TP19	K - 5
CN6	M - 2			Q6	B - 2	Q32	G - 2	RV6	E - 4	TP21	M - 3
CN7	M - 4	IC1	C - 3	Q7	E - 2	Q33	G - 3	RV7	E - 3	TP22	M - 3
CN8	M - 3	IC2	D - 2	Q8	E - 4	Q34	J - 3	RV8	G - 5	TP23	M - 1
CN9	A - 3	IC3	D - 4	Q9	E - 2	Q35	J - 3	RV9	G - 4	TP24	E - 5
		IC4	K - 4	Q10	D - 1	Q36	J - 4	RV10	K - 3	TP25	F - 3
CV1	H - 5	IC5	G - 5	Q11	D - 1	Q37	J - 4	RV11	J - 4		
		IC6	G - 3	Q12	A - 3	Q38	I - 4				
D3	L - 3	IC7	I - 5	Q13	A - 4	Q39	J - 4	TP1	A - 2		
D4	L - 3	IC8	H - 2	Q14	A - 4	Q40	I - 5	TP2	B - 1		
		IC9	I - 3	Q15	D - 5	Q41	J - 5	TP3	B - 2		
DL1	E - 2	IC12	L - 2	Q16	D - 4	Q42	L - 5	TP4	D - 3		
DL2	A - 4	IC15	G - 1	Q17	E - 5	Q43	L - 4	TP5	D - 2		
		IC16	I - 2	Q18	E - 5	Q44	L - 3	TP6	D - 2		
E1	A - 2	IC17	G - 3	Q19	B - 5	Q45	M - 2	TP7	D - 2		
E2	A - 5			Q20	A - 5	Q46	M - 4	TP8	B - 3		
E3	E - 3			Q21	C - 4	Q47	J - 2	TP9	C - 4		
E4	F - 2			Q22	C - 5	Q48	G - 1	TP10	C - 4		
E5	E - 2			Q23	C - 4	Q49	I - 1	TP11	B - 5		
E6	J - 4			Q24	F - 4	Q50	F - 2	TP12	C - 5		
E7	E - 5			Q25	E - 5	Q51	E - 2	TP13	F - 5		
E8	K - 2			Q26	F - 4	Q52	A - 2	TP14	F - 4		

SV-69 (TBC)

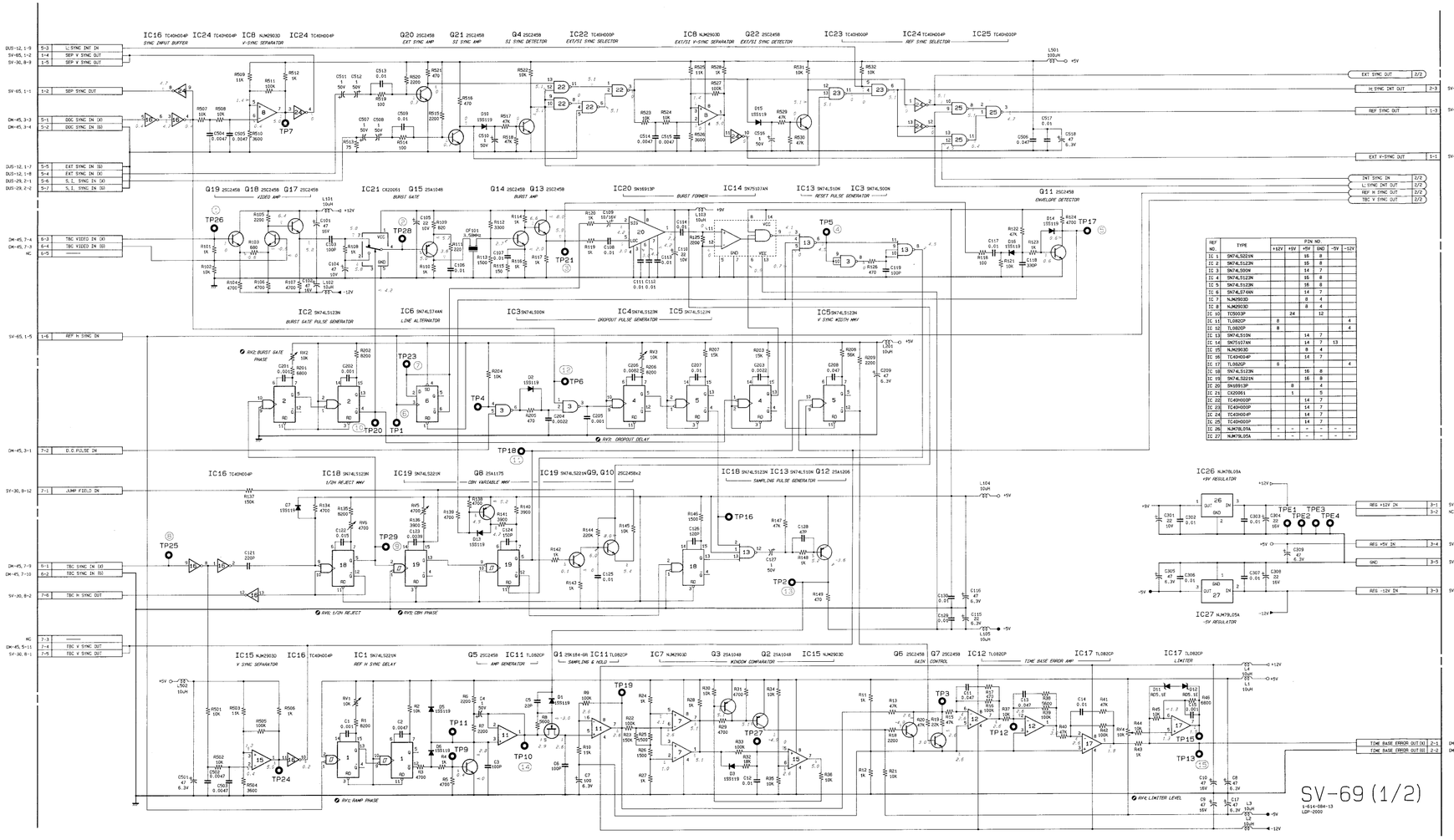


SV-69 -SOLDERING SIDE-
1-614-084-13
LDP-2000



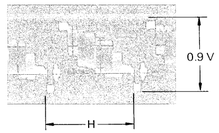
CF101	G - 3	D701	I - 3	IC26	A - 3	Q20	H - 4	TP12	C - 2
		D702	I - 3	IC27	A - 3	Q21	H - 4	TP13	C - 4
CN1	L - 4			IC601	L - 1	Q22	J - 4	TP15	B - 3
CN2	B - 4	IC1	C - 1	IC701	K - 2	Q601	J - 1	TP16	E - 1
CN3	A - 3	IC2	H - 1	IC702	K - 3	Q602	K - 1	TP17	F - 3
CN5	G - 4	IC3	E - 1	IC703	I - 2	Q603	J - 1	TP18	D - 2
CN6	F - 4	IC4	G - 1	IC704	J - 2	Q604	J - 1	TP19	A - 1
CN7	C - 4	IC5	G - 2	IC705	I - 1	Q701	J - 3	TP20	H - 1
CN8	I - 3	IC6	F - 1			Q702	J - 3	TP21	F - 3
		IC7	A - 2	Q1	B - 1			TP22	L - 2
CV1	K - 3	IC8	I - 4	Q2	A - 3	RV1	C - 1	TP23	F - 2
		IC10	L - 2	Q3	A - 3	RV2	H - 2	TP24	C - 2
D1	B - 1	IC11	A - 1	Q4	H - 4	RV3	H - 2	TP25	C - 4
D2	F - 1	IC12	B - 3	Q5	B - 1	RV4	B - 4	TP26	F - 4
D3	A - 2	IC13	D - 1	Q6	B - 2	RV5	D - 3	TP27	B - 2
D4	L - 3	IC14	E - 2	Q7	B - 3	RV6	D - 3	TP28	G - 2
D5	C - 1	IC15	C - 2	Q8	E - 4			TP29	D - 3
D6	C - 1	IC16	C - 3	Q9	E - 4	TP1	F - 1		
D7	D - 3	IC17	C - 4	Q10	E - 4	TP2	D - 1	TPE1	A - 4
D10	H - 3	IC18	D - 2	Q11	F - 3	TP3	B - 2	TPE2	D - 4
D11	B - 3	IC19	D - 4	Q12	D - 1	TP4	F - 1	TPE3	H - 2
D12	B - 3	IC20	F - 2	Q13	F - 3	TP5	E - 2	TPE4	L - 2
D13	E - 4	IC21	G - 2	Q14	F - 3	TP6	E - 1		
D14	F - 4	IC22	H - 3	Q15	G - 3	TP7	I - 3	X401	L - 3
D15	J - 4	IC23	J - 4	Q17	G - 3	TP9	C - 1		
D16	F - 4	IC24	K - 4	Q18	G - 4	TP10	B - 1		
D601	L - 1	IC25	L - 4	Q19	F - 4	TP11	B - 1		

SV-69 (TBC)

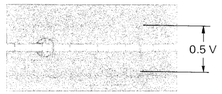


REF NO.	TYPE	PIN NO.				
		+12V	+5V	GND	-5V	-12V
IC 1	SN74LS221N			16	8	
IC 2	SN74LS123N			16	8	
IC 3	SN74LS00N			14	7	
IC 4	SN74LS123N			16	8	
IC 5	SN74LS123N			16	8	
IC 6	SN74LS74AN			14	7	
IC 7	NJM2903D			8	4	
IC 8	NJM2903D			8	4	
IC 10	TC5003P		24		12	
IC 11	TL082CP	8				4
IC 12	TL082CP	8				4
IC 13	SN74LS10N			14	7	
IC 14	SN75107AN			14	7	13
IC 15	NJM2903D			8	4	
IC 16	TC4049AP			14	7	
IC 17	TL082CP	8				4
IC 18	SN74LS123N			16	8	
IC 19	SN74LS221N			16	8	
IC 20	SN5691JP		8		4	
IC 21	CX20061		1		5	
IC 22	TC4049DP			14	7	
IC 23	TC4049DP			14	7	
IC 24	TC4049AP			14	7	
IC 25	TC4049DP			14	7	
IC 26	NJM78L09A	-	-	-	-	-
IC 27	NJM79L05A	-	-	-	-	-

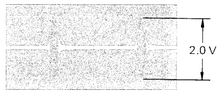
① TP26



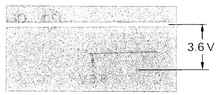
② TP28



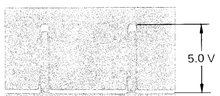
③ TP21



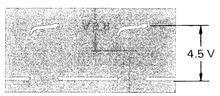
④ TP5



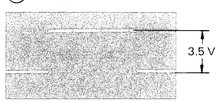
⑤ TP17



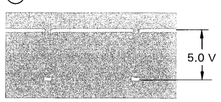
⑥ TP1



⑦ TP23



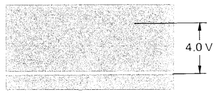
⑧ TP25



⑨ TP29

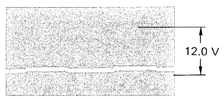
⑩ TP20

⑪ TP18



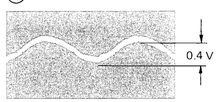
⑫ TP6

⑬ TP2



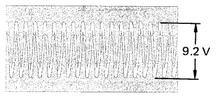
⑭ TP10

⑮ TP13

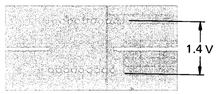


SV-69 (SYNC GENERATOR)

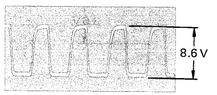
⑯ **IC 10-1**



⑲ **IC 601-4**

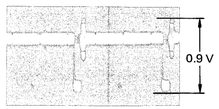


⑰ **IC 10-22**

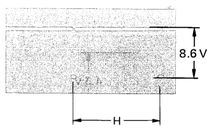


3.58 MHz

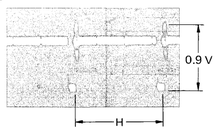
⑳ **Q604-E**

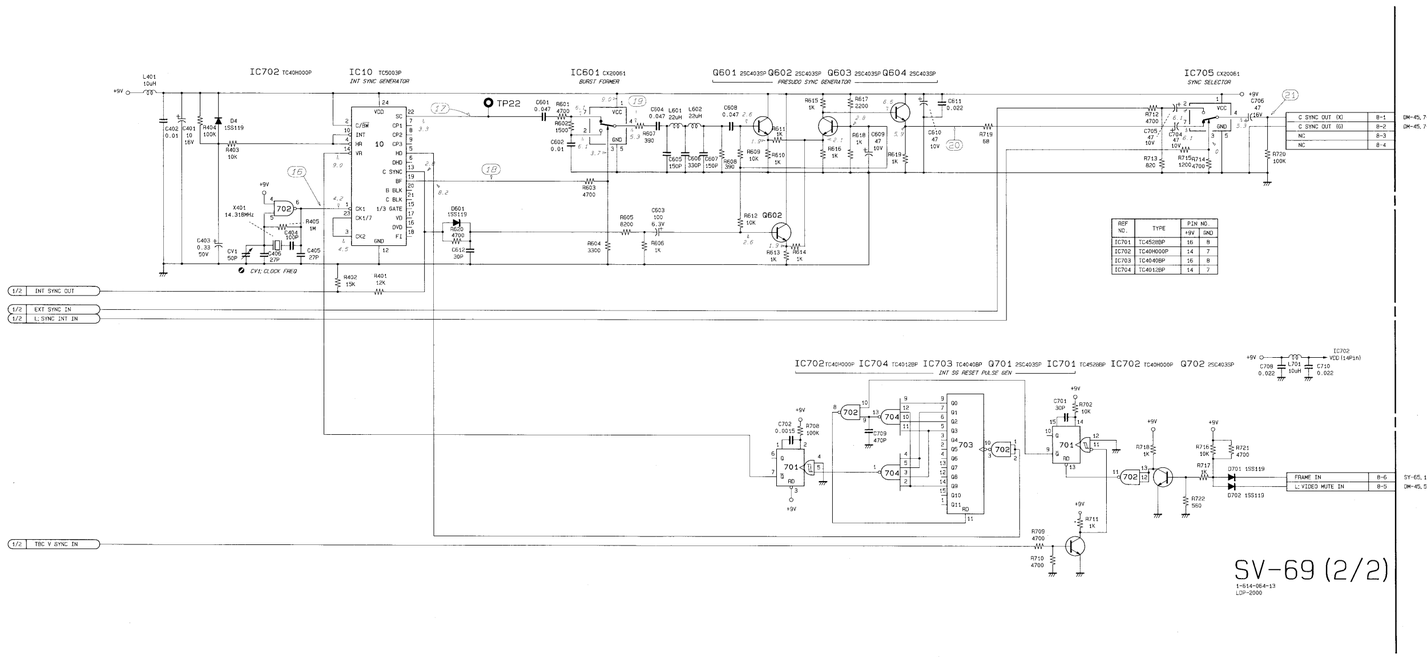


⑱ **IC 10-19**



㉑ **CN8-1**

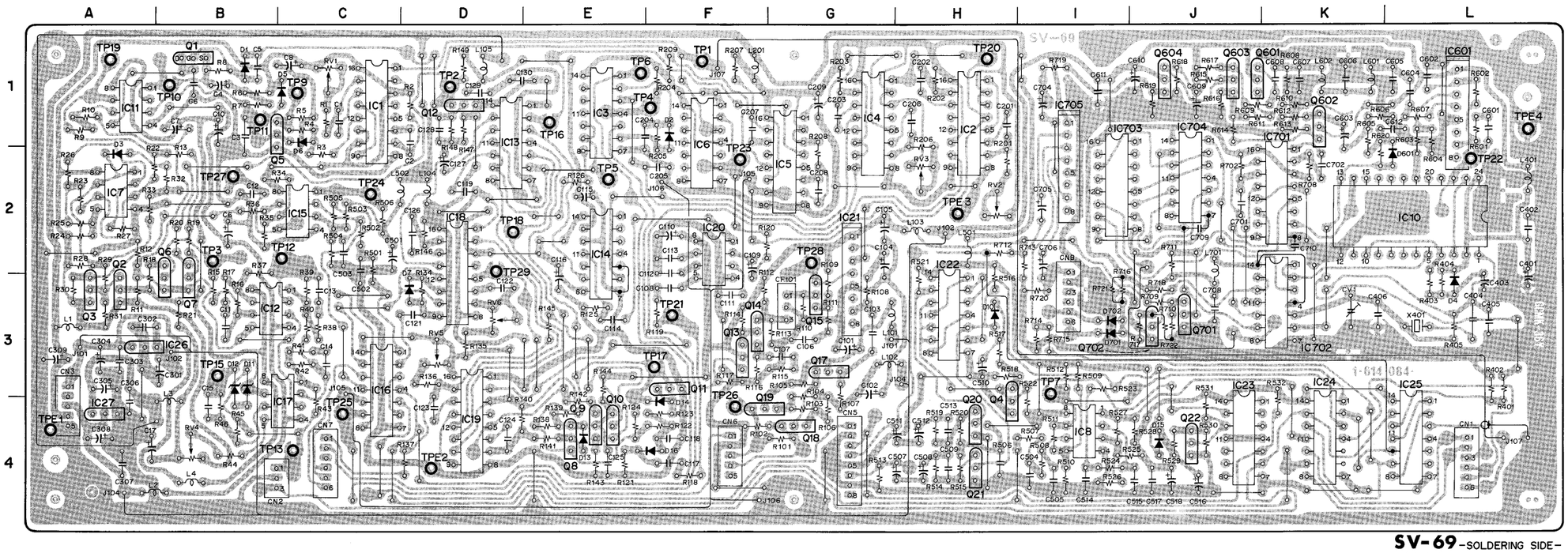




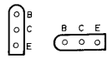
SV-69 (2/2)

1-614-064-13
LDP-2000

SV-69 (SYNC GENERATOR)



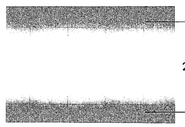
SV-69 –SOLDERING SIDE–
1-614-084-13
LDP-2000



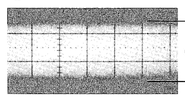
CF101	G - 3	D701	I - 3	IC26	A - 3	Q20	H - 4	TP12	C - 2
		D702	I - 3	IC27	A - 3	Q21	H - 4	TP13	C - 4
CN1	L - 4			IC601	L - 1	Q22	J - 4	TP15	B - 3
CN2	B - 4	IC1	C - 1	IC701	K - 2	Q601	J - 1	TP16	E - 1
CN3	A - 3	IC2	H - 1	IC702	K - 3	Q602	K - 1	TP17	F - 3
CN5	G - 4	IC3	E - 1	IC703	I - 2	Q603	J - 1	TP18	D - 2
CN6	F - 4	IC4	G - 1	IC704	J - 2	Q604	J - 1	TP19	A - 1
CN7	C - 4	IC5	G - 2	IC705	I - 1	Q701	J - 3	TP20	H - 1
CN8	I - 3	IC6	F - 1			Q702	J - 3	TP21	F - 3
		IC7	A - 2	Q1	B - 1			TP22	L - 2
CV1	K - 3	IC8	I - 4	Q2	A - 3	RV1	C - 1	TP23	F - 2
		IC10	L - 2	Q3	A - 3	RV2	H - 2	TP24	C - 2
D1	B - 1	IC11	A - 1	Q4	H - 4	RV3	H - 2	TP25	C - 4
D2	F - 1	IC12	B - 3	Q5	B - 1	RV4	B - 4	TP26	F - 4
D3	A - 2	IC13	D - 1	Q6	B - 2	RV5	D - 3	TP27	B - 2
D4	L - 3	IC14	E - 2	Q7	B - 3	RV6	D - 3	TP28	G - 2
D5	C - 1	IC15	C - 2	Q8	E - 4			TP29	D - 3
D6	C - 1	IC16	C - 3	Q9	E - 4	TP1	F - 1		
D7	D - 3	IC17	C - 4	Q10	E - 4	TP2	D - 1	TPE1	A - 4
D10	H - 3	IC18	D - 2	Q11	F - 3	TP3	B - 2	TPE2	D - 4
D11	B - 3	IC19	D - 4	Q12	D - 1	TP4	F - 1	TPE3	H - 2
D12	B - 3	IC20	F - 2	Q13	F - 3	TP5	E - 2	TPE4	L - 2
D13	E - 4	IC21	G - 2	Q14	F - 3	TP6	E - 1		
D14	F - 4	IC22	H - 3	Q15	G - 3	TP7	I - 3	X401	L - 3
D15	J - 4	IC23	J - 4	Q17	G - 3	TP9	C - 1		
D16	F - 4	IC24	K - 4	Q18	G - 4	TP10	B - 1		
D601	L - 1	IC25	L - 4	Q19	F - 4	TP11	B - 1		

SA-16 (AUDIO SYSTEM)

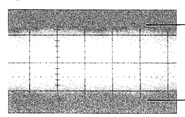
① TP1



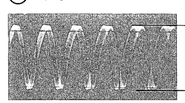
② TP2



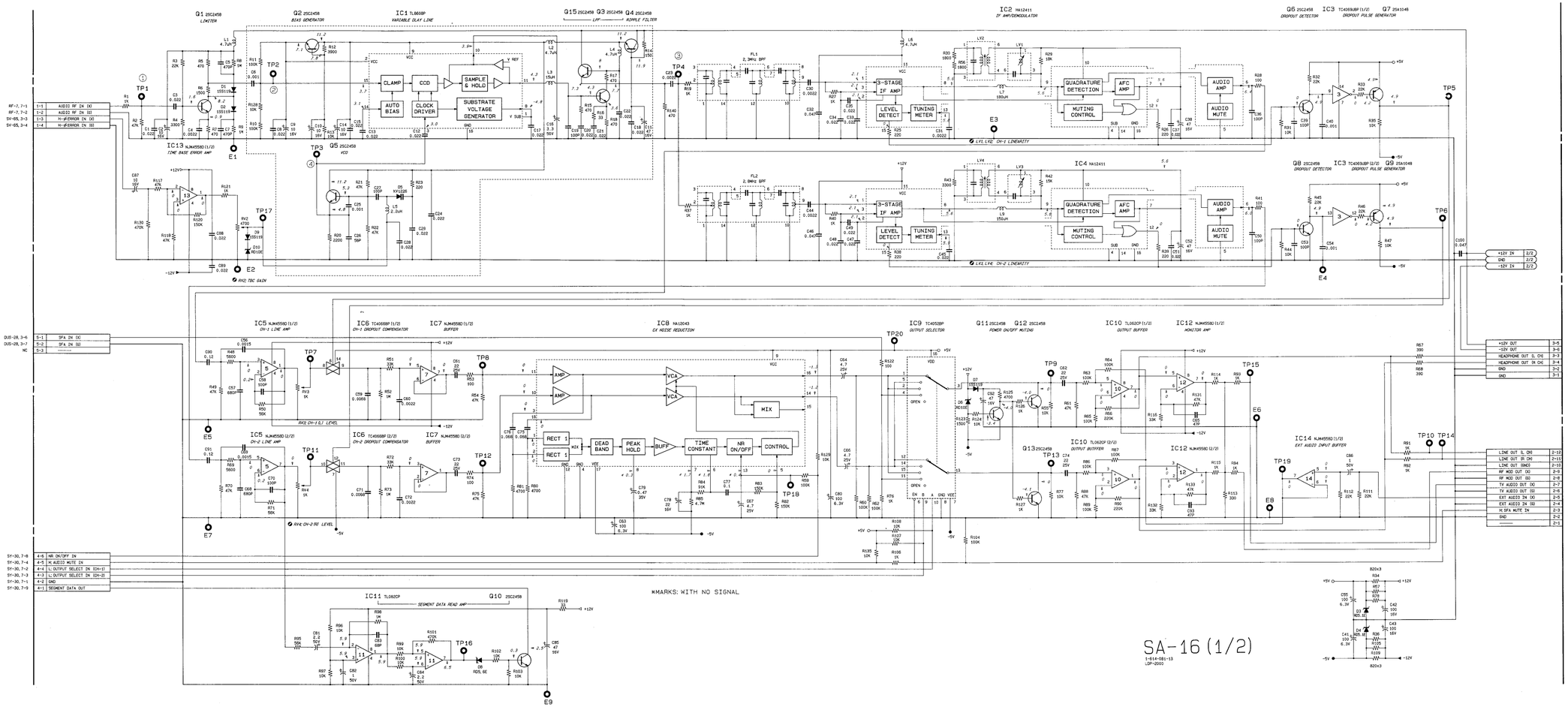
③ TP4



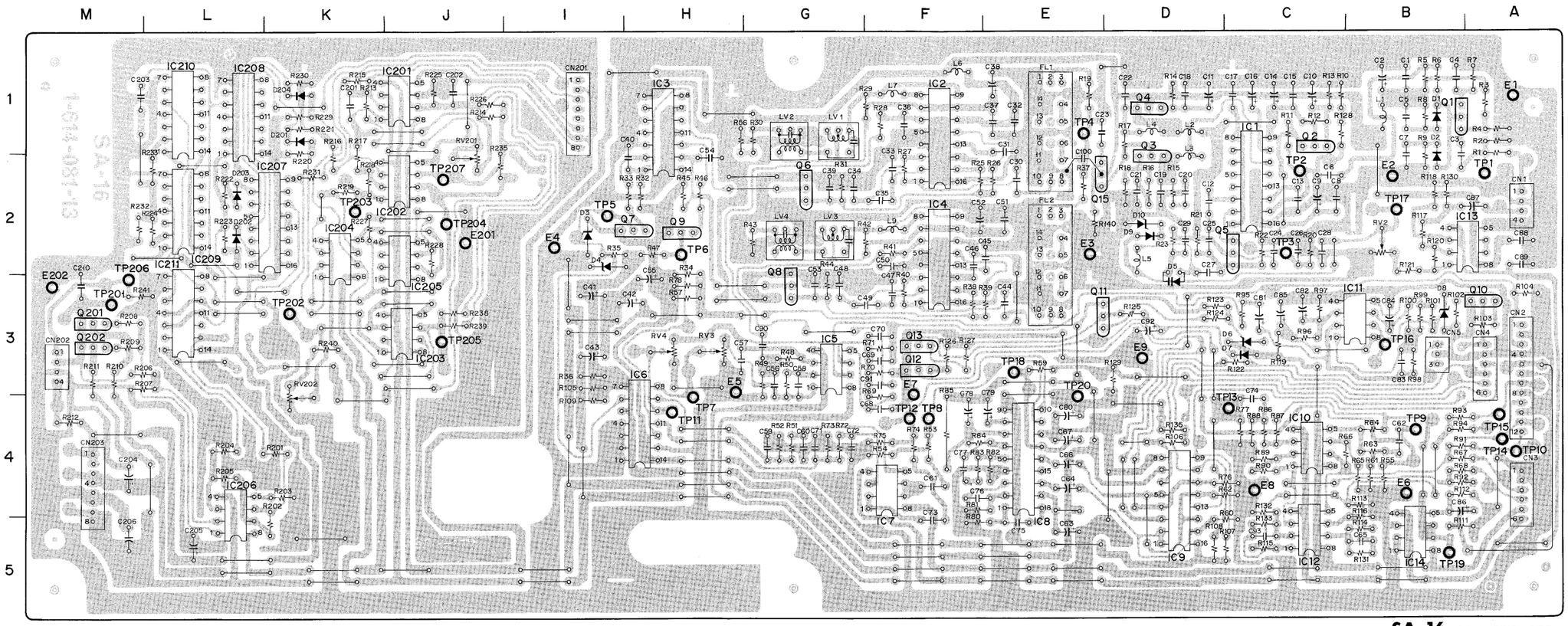
④ TP3



9 MHz (T=110 nS)


Q1 2SC2458 LIMITER
Q2 2SC2458 BIAS GENERATOR
IC1 TL866P VARIABLE CLAY LINE
Q15 2SC2458 Q3 2SC2458 Q4 2SC2458 LPF RIPPLE FILTER
IC2 HA12411 IF AMP/DEMODULATOR
Q6 2SC2458 IC3 TC4069UBF (1/2) DROPOUT DETECTION
Q7 2SA1048 DROPOUT PULSE GENERATOR
IC13 NJM4558D (1/2) TIME BASE ERROR AMP
Q5 2SC2458 VCO
IC4 HA12411
Q8 2SC2458 IC3 TC4069UBF (2/2)
Q9 2SA1048
IC5 NJM4558D (1/2) CH-1 LINE AMP
IC6 TC4066BF (1/2) CH-1 DROPOUT COMPENSATOR
IC7 NJM4558D (1/2) BUFFER
IC8 HA12043 CX NOISE REDUCTION
IC9 TC4052BP OUTPUT SELECTOR
Q11 2SC2458 Q12 2SC2458 MONO ON/OFF MUTING
IC10 TL062CP (1/2) OUTPUT BUFFER
IC12 NJM4558D (1/2) MONITOR AMP
IC5 NJM4558D (2/2) CH-2 LINE AMP
IC6 TC4066BF (2/2) CH-2 DROPOUT COMPENSATOR
IC7 NJM4558D (2/2) BUFFER
IC10 TL062CP (2/2) OUTPUT BUFFER
IC12 NJM4558D (2/2)
IC14 NJM4558D (1/2) EXT AUDIO INPUT BUFFER
IC11 TL062CP SEGMENT DATA READ AMP
Q10 2SC2458
RECT 1
RECT 2
DEAD BAND
PEAK HOLD
BUFF
TIME CONSTANT
NR ON/OFF
CONTROL
MIX
VCA
AMP
CLAMP
CCD
SAMPLE & HOLD
AUTO BIAS
CLOCK DRIVER
SUBSTRATE VOLTAGE GENERATOR
3-STAGE IF AMP
LEVEL DETECT
TUNING METER
QUADRATURE DETECTION
MUTING CONTROL
AFC AMP
AUDIO AMP
AUDIO MUTE
RF-7, 7-1 1-1 AUDIO RF IN (X)
RF-7, 7-2 1-2 AUDIO RF IN (G)
SY-05, 3-3 1-3 H-pERROR IN (X)
SY-05, 3-4 1-4 H-pERROR IN (G)
DU5-28, 3-6 5-1 SFA IN (X)
DU5-28, 3-7 5-2 SFA IN (G)
NC 5-3 ——
SY-30, 7-8 4-6 NR ON/OFF IN
SY-30, 7-4 4-5 M.AUDIO MUTE IN
SY-30, 7-2 4-4 L OUTPUT SELECT IN (CH-1)
SY-30, 7-3 4-3 L OUTPUT SELECT IN (CH-2)
SY-30, 7-1 4-2 GND
SY-30, 7-9 4-1 SEGMENT DATA OUT
+12V IN 3-5 MP-18, 1-5
-12V OUT 3-6 MP-18, 1-6
HEADPHONE OUT (L CH) 3-3 MP-18, 1-3
HEADPHONE OUT (R CH) 3-4 MP-18, 1-4
GND 3-2 MP-18, 1-2
GND 3-1 MP-18, 1-1
LINE OUT (L CH) 2-12 DU-84, 1-3
LINE OUT (R CH) 2-11 DU-84, 1-5
LINE OUT (GND) 2-10 DU-84, 1-4
RF MOD OUT (X) 2-9 RF-MOD, 1-2
RF MOD OUT (G) 2-8 RF-MOD, 1-1
TV AUDIO OUT (X) 2-7 DU-84, 1-1
TV AUDIO OUT (G) 2-6 DU-84, 1-2
EXT AUDIO IN (X) 2-5 DU5-29, 1-2
EXT AUDIO IN (G) 2-4 DU5-29, 1-3
M.SFA MUTE IN 2-3 DU5-28, 3-9
GND 2-2 NC
—— 2-1 NC
+12V IN 1/3
GND 2/3
-12V IN 1/3
*MARKS: WITH NO SIGNAL
SA-16 (1/2)
1-614-081-13
LDP-2000

SA-16 (AUDIO SYSTEM)



SA-16 – SOLDERING SIDE –

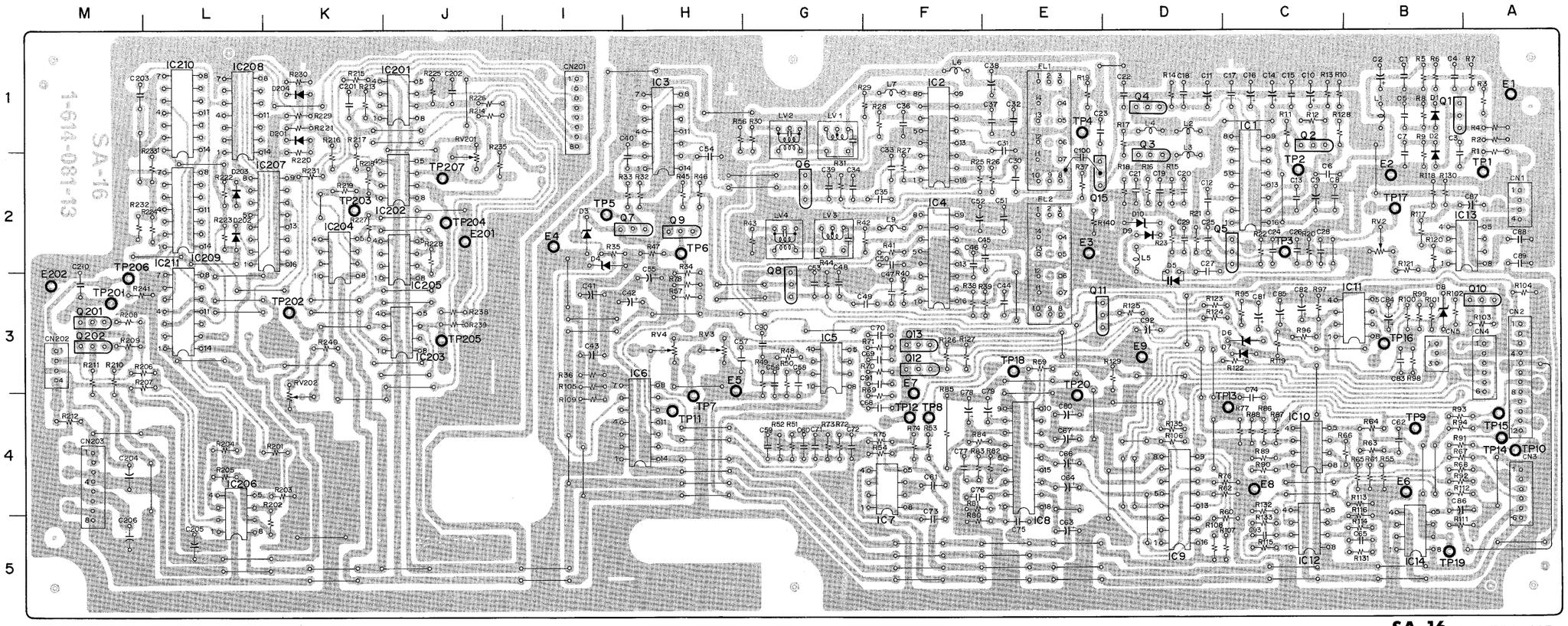
1-614-081-13

LDP-2000

E C B

CN1	A - 2	E1	A - 1	IC10	C - 4	Q1	B - 1	TP1	A - 2	TP205	J - 3
CN2	A - 3	E2	B - 2	IC11	B - 3	Q2	C - 1	TP2	C - 2	TP206	M - 3
CN3	A - 4	E3	E - 2	IC12	C - 5	Q3	D - 2	TP3	C - 2	TP207	J - 2
CN4	A - 3	E4	I - 2	IC13	A - 2	Q4	D - 1	TP4	E - 1		
CN5	B - 3	E5	H - 3	IC14	B - 5	Q5	C - 2	TP5	J - 2		
CN201	I - 1	E6	B - 4	IC201	J - 1	Q6	G - 2	TP6	H - 2		
CN202	M - 3	E7	F - 3	IC202	J - 2	Q7	H - 2	TP7	H - 4		
CN203	M - 4	E8	C - 4	IC203	J - 3	Q8	G - 3	TP8	F - 4		
		E9	D - 3	IC204	K - 2	Q9	H - 2	TP9	B - 4		
D1	B - 1	E201	J - 2	IC205	J - 2	Q10	A - 3	TP10	A - 4		
D2	B - 2	E202	M - 3	IC206	L - 4	Q11	E - 3	TP11	H - 4		
D3	I - 2			IC207	K - 2	Q12	F - 3	TP12	F - 4		
D4	I - 2	FL1	E - 1	IC208	L - 1	Q13	F - 3	TP13	C - 4		
D5	D - 3	FL2	E - 2	IC209	L - 2	Q15	F - 2	TP14	A - 4		
D6	C - 3			IC210	L - 1	Q201	M - 3	TP15	A - 4		
D7	C - 3	IC1	C - 2	IC211	L - 3	Q202	M - 3	TP16	B - 3		
D8	B - 3	IC2	F - 1					TP17	B - 2		
D9	D - 2	IC3	H - 1	LV1	G - 1	RV2	B - 2	TP18	E - 3		
D10	D - 2	IC4	F - 2	LV2	G - 1	RV3	H - 3	TP19	B - 5		
D201	K - 1	IC5	G - 3	LV3	G - 2	RV4	H - 3	TP20	E - 4		
D202	L - 2	IC6	H - 4	LV4	G - 2	RV201	J - 2	TP201	M - 3		
D203	L - 2	IC7	F - 4			RV202	K - 4	TP202	K - 3		
D204	K - 1	IC8	E - 4					TP203	K - 2		
		IC9	D - 4					TP204	J - 2		

SA-16 (SKEW SERVO)



SA-16 – SOLDERING SIDE –
1-614-081-13
LDP-2000

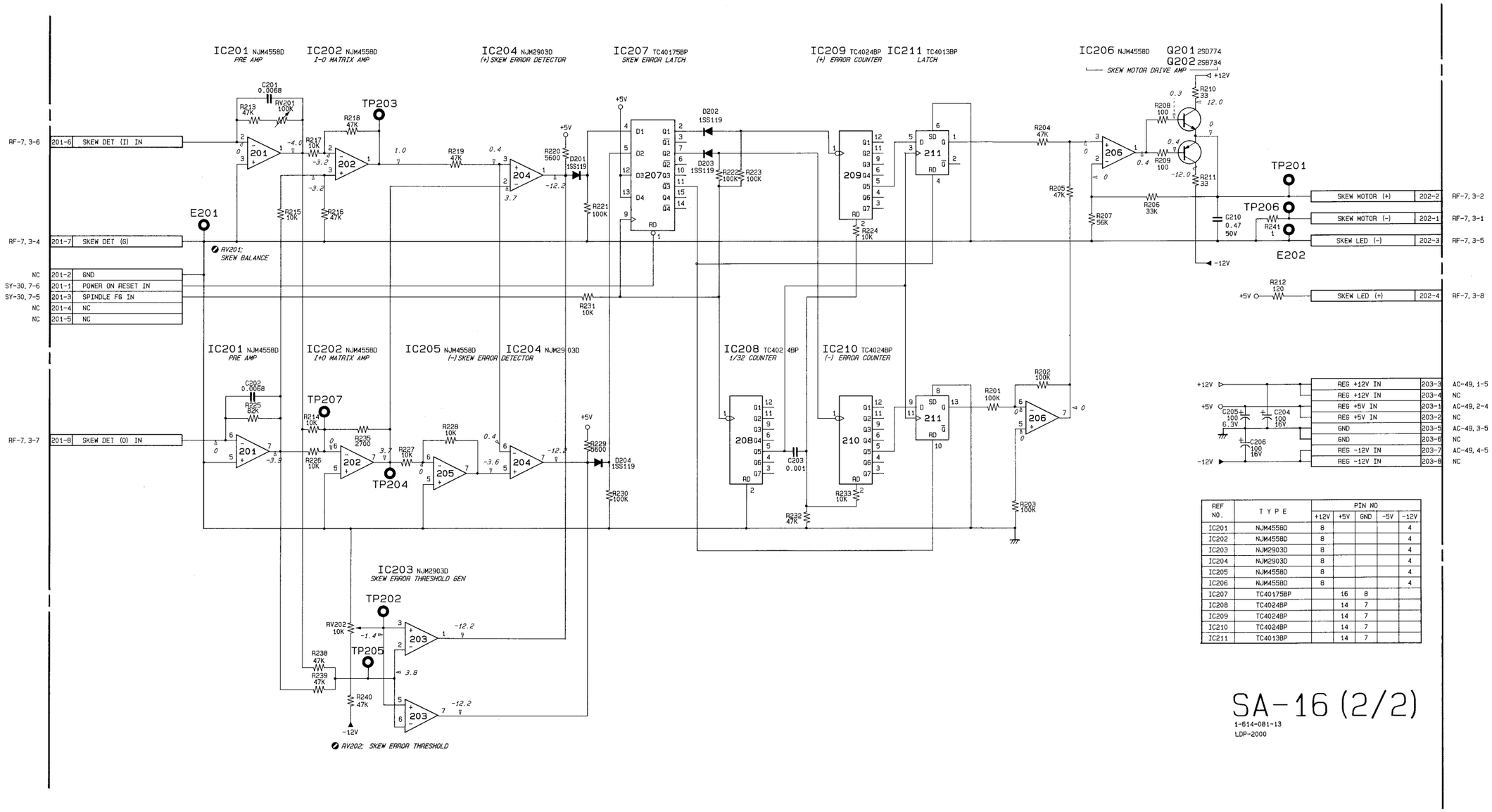
E C B

E C B

CN1	A - 2	E1	A - 1	IC10	C - 4	Q1	B - 1	TP1	A - 2
CN2	A - 3	E2	B - 2	IC11	B - 3	Q2	C - 1	TP2	C - 2
CN3	A - 4	E3	E - 2	IC12	C - 5	Q3	D - 2	TP3	C - 2
CN4	A - 3	E4	I - 2	IC13	A - 2	Q4	D - 1	TP4	E - 1
CN5	B - 3	E5	H - 3	IC14	B - 5	Q5	C - 2	TP5	I - 2
CN201	I - 1	E6	B - 4	IC201	J - 1	Q6	G - 2	TP6	H - 2
CN202	M - 3	E7	F - 3	IC202	J - 2	Q7	H - 2	TP7	H - 4
CN203	M - 4	E8	C - 4	IC203	J - 3	Q8	G - 3	TP8	F - 4
		E9	D - 3	IC204	K - 2	Q9	H - 2	TP9	B - 4
D1	B - 1	E201	J - 2	IC205	J - 2	Q10	A - 3	TP10	A - 4
D2	B - 2	E202	M - 3	IC206	L - 4	Q11	E - 3	TP11	H - 4
D3	I - 2			IC207	K - 2	Q12	F - 3	TP12	F - 4
D4	I - 2	FL1	E - 1	IC208	L - 1	Q13	F - 3	TP13	C - 4
D5	D - 3	FL2	E - 2	IC209	L - 2	Q15	F - 2	TP14	A - 4
D6	C - 3			IC210	L - 1	Q201	M - 3	TP15	A - 4
D7	C - 3	IC1	C - 2	IC211	L - 3	Q202	M - 3	TP16	B - 3
D8	B - 3	IC2	F - 1					TP17	B - 2
D9	D - 2	IC3	H - 1	LV1	G - 1	RV2	B - 2	TP18	E - 3
D10	D - 2	IC4	F - 2	LV2	G - 1	RV3	H - 3	TP19	B - 5
D201	K - 1	IC5	G - 3	LV3	G - 2	RV4	H - 3	TP20	E - 4
D202	L - 2	IC6	H - 4	LV4	G - 2	RV201	J - 2	TP201	M - 3
D203	L - 2	IC7	F - 4			RV202	K - 4	TP202	K - 3
D204	K - 1	IC8	E - 4					TP203	K - 2
		IC9	D - 4					TP204	J - 2

TP205	J - 3
TP206	M - 3
TP207	J - 2

SA-16 (SKEW SERVO)


IC201 NJM4558D PRE AMP
IC202 NJM4558D I-O MATRIX AMP
IC204 NJM2903D (+) SKEW ERROR DETECTOR
IC207 TC40175BP SKEW ERROR LATCH
IC209 TC4024BP (+) ERROR COUNTER
IC211 TC4013BP LATCH
IC206 NJM4558D
Q201 2SD774
Q202 2SB734
SKEW MOTOR DRIVE AMP
RF-7, 3-6 201-6 SKEW DET (I) IN
RF-7, 3-4 201-7 SKEW DET (G)
NC 201-2 GND
SY-30, 7-6 201-1 POWER ON RESET IN
SY-30, 7-5 201-3 SPINDLE FG IN
NC 201-4 NC
NC 201-5 NC
E201
RV201: SKEW BALANCE
TP203
TP201
TP206
E202
SKEW MOTOR (+) 202-2 RF-7, 3-2
SKEW MOTOR (-) 202-1 RF-7, 3-1
SKEW LED (-) 202-3 RF-7, 3-5
SKEW LED (+) 202-4 RF-7, 3-8
REG +12V IN 203-3 AC-49, 1-5
REG +12V IN 203-4 NC
REG +5V IN 203-1 AC-49, 2-4
REG +5V IN 203-2 NC
GND 203-5 AC-49, 3-5
GND 203-6 NC
REG -12V IN 203-7 AC-49, 4-5
REG -12V IN 203-8 NC
IC201 NJM4558D PRE AMP
IC202 NJM4558D I+O MATRIX AMP
IC205 NJM4558D (-) SKEW ERROR DETECTOR
IC204 NJM2903D
IC208 TC4024BP 1/32 COUNTER
IC210 TC4024BP (-) ERROR COUNTER
RF-7, 3-7 201-8 SKEW DET (O) IN
TP207
TP204
TP202
TP205
IC203 NJM2903D SKEW ERROR THRESHOLD GEN
RV202: SKEW ERROR THRESHOLD

REF NO.	TYPE	PIN NO				
		+12V	+5V	GND	-5V	-12V
IC201	NJM4558D	8				4
IC202	NJM4558D	8				4
IC203	NJM2903D	8				4
IC204	NJM2903D	8				4
IC205	NJM4558D	8				4
IC206	NJM4558D	8				4
IC207	TC40175BP		16	8		
IC208	TC4024BP		14	7		
IC209	TC4024BP		14	7		
IC210	TC4024BP		14	7		
IC211	TC4013BP		14	7		

SA-16 (2/2)

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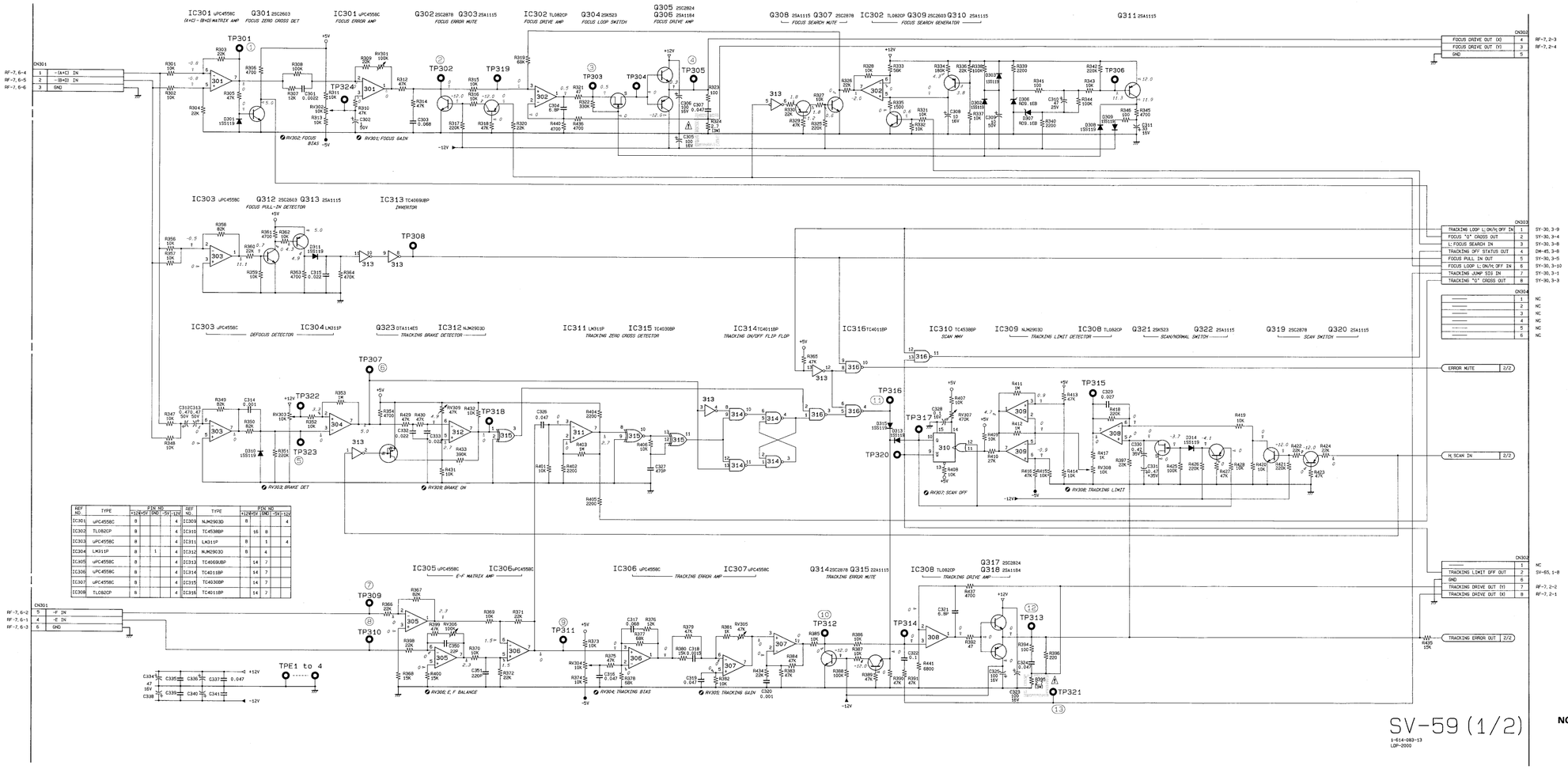
SV-59 (FOCUS/TRACKING SERVO)



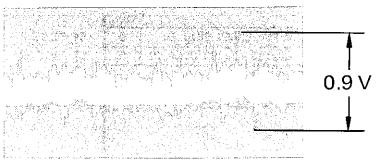
REF NO.	TYPE	PIN NO. +12	+5V	GND	-5V	-12V	REF NO.	TYPE	PIN NO. +12	+5V	GND	-5V	-12V
IC301	uPC4558C	8				4	IC309	NJM2903D	8				4
IC302	TL082CP	8				4	IC310	TC4538BP			16	8	
IC303	uPC4558C	8				4	IC311	LM311P	8		1		4
IC304	LM311P	8		1		4	IC312	NJM2903D	8		4		
IC305	uPC4558C	8				4	IC313	TC4069UBP		14	7		
IC306	uPC4558C	8				4	IC314	TC4011BP		14	7		
IC307	uPC4558C	8				4	IC315	TC4030BP		14	7		
IC308	TL082CP	8				4	IC316	TC4011BP		14	7		

NOTES:

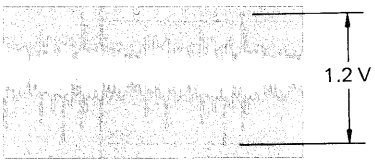
1. **The shaded and ⚠ -marked components are critical to safety.**
   Replace only with same components as specified.

SV-59 (FOCUS/TRACKING SERVO)

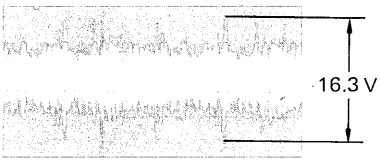
① **TP301**



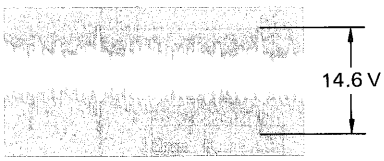
② **TP302**



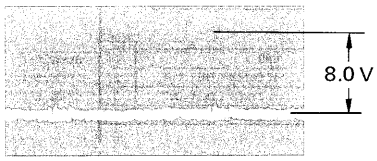
③ **TP303**



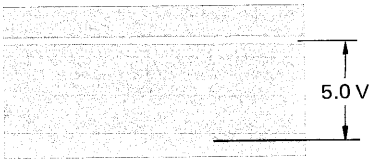
④ **TP305**



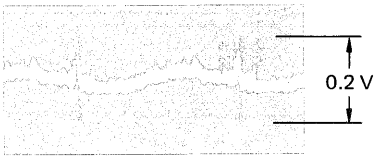
⑤ **TP323** (STILL MODE)



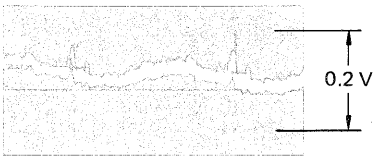
⑥ **TP307** (STILL MODE)



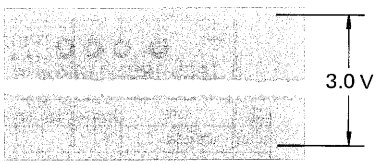
⑦ **TP309** (STILL MODE)



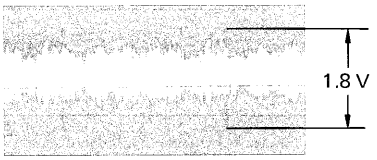
⑧ **TP310** (STILL MODE)



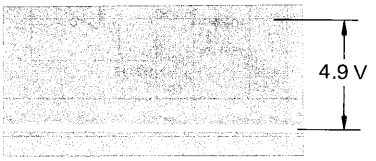
⑨ **TP311** (STILL MODE)



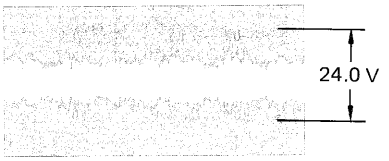
⑩ **TP312** (STILL MODE)



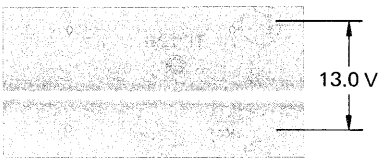
⑪ **TP316** (STILL MODE)



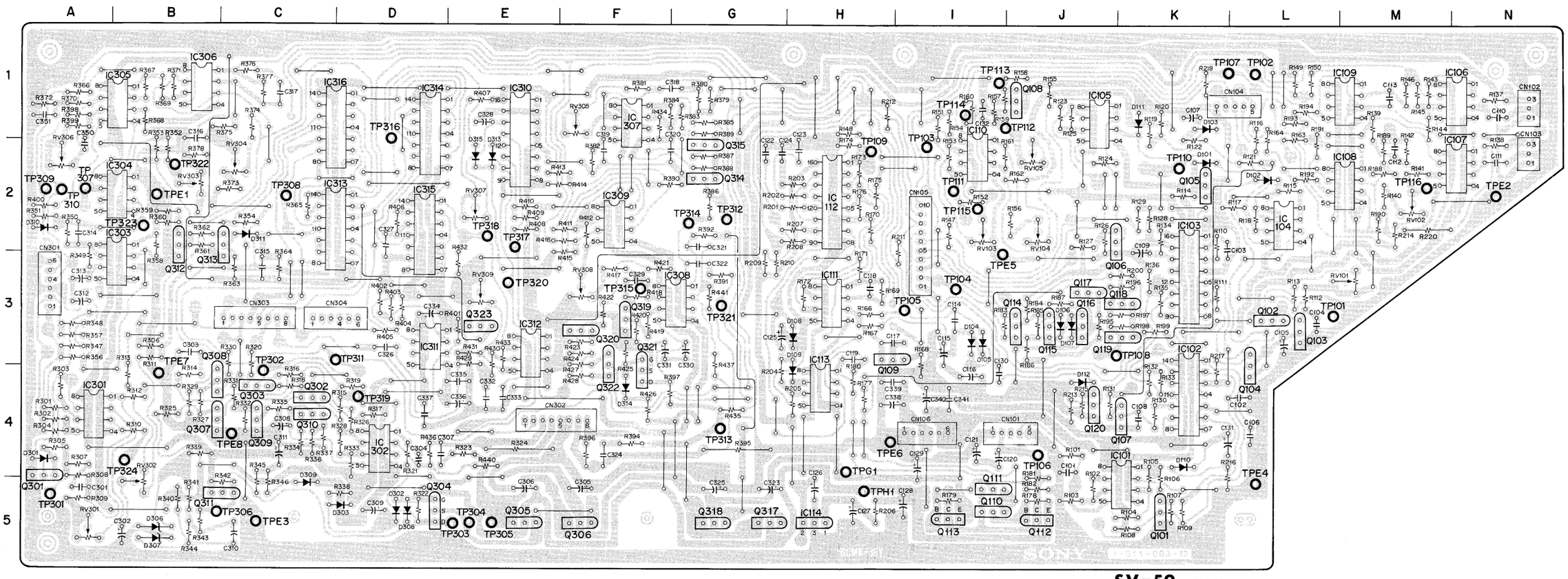
⑫ **TP313** (STILL MODE)



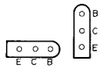
⑬ **TP321** (STILL MODE)



SV-59

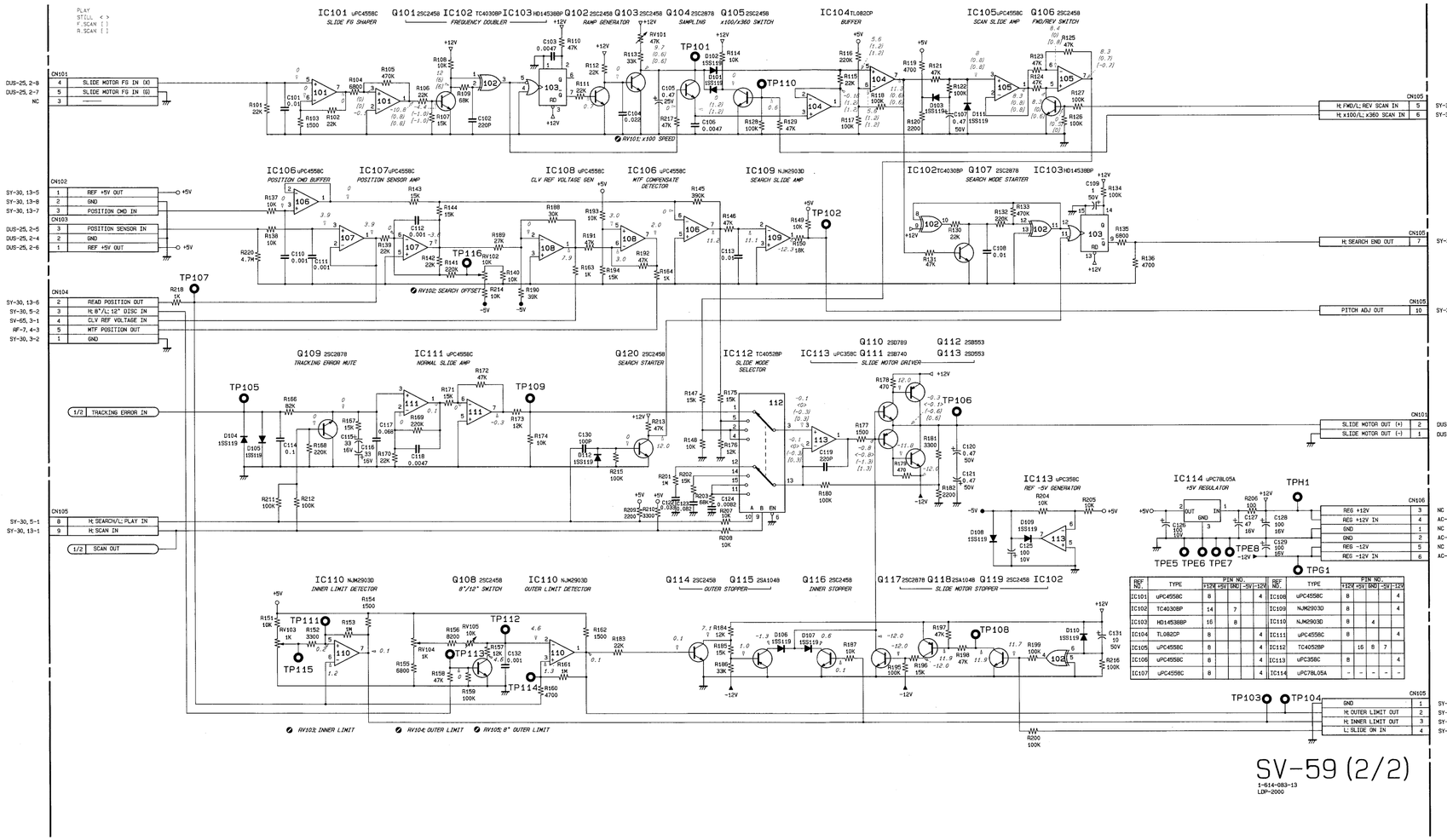


SV-59 –SOLDERING SIDE–
1 – 614 – 083 – 13
LDP – 2000

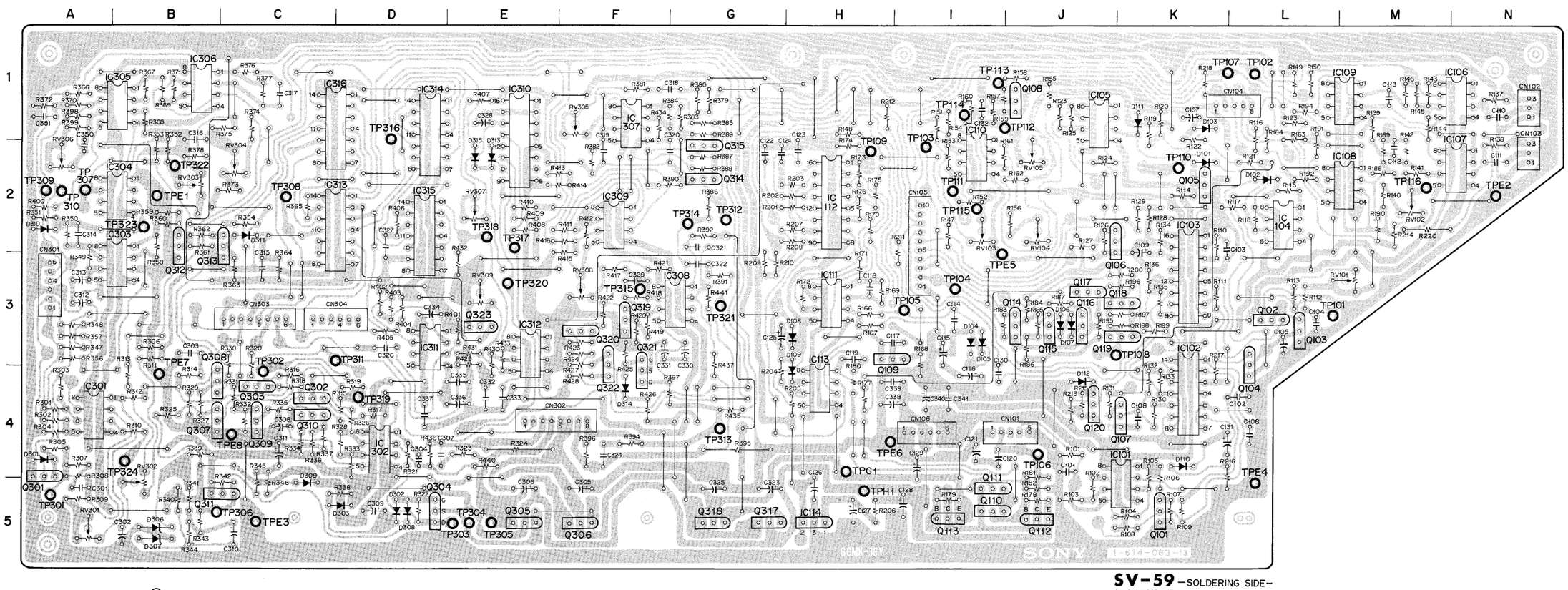


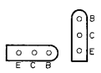
CN101	J - 4	D302	D - 5	IC114	H - 5	Q107	K - 4	Q311	C - 5	RV307	E - 2	TP305	E - 5	TPE4	L - 5
CN102	N - 1	D303	D - 5	IC301	A - 4	Q108	J - 1	Q312	B - 2	RV308	F - 3	TP306	B - 5	TPE5	I - 2
CN103	N - 2	D306	B - 5	IC302	D - 4	Q109	H - 3	Q313	C - 2	RV309	E - 3	TP307	A - 2	TPE6	H - 4
CN104	L - 1	D307	B - 5	IC303	B - 3	Q110	I - 5	Q314	G - 2			TP308	C - 2	TPE7	B - 4
CN105	I - 2	D308	D - 5	IC304	B - 2	Q111	I - 5	Q315	G - 2	TP101	L - 3	TP309	A - 2	TPE8	C - 4
CN106	I - 4	D309	C - 5	IC305	B - 1	Q112	J - 5	Q317	G - 5	TP102	L - 1	TP310	A - 2	TPH1	H - 5
CN301	A - 3	D310	A - 2	IC306	B - 1	Q113	I - 5	Q318	G - 5	TP103	I - 2	TP311	D - 3	TPG1	H - 4
CN302	E - 4	D311	C - 2	IC307	F - 1	Q114	J - 3	Q319	F - 3	TP104	I - 3	TP312	G - 2		
CN303	C - 3	D313	E - 2	IC308	G - 3	Q115	J - 3	Q320	F - 3	TP105	I - 3	TP313	G - 4		
CN304	C - 3	D314	F - 4	IC309	F - 2	Q116	J - 3	Q321	F - 4	TP106	J - 4	TP314	G - 2		
		D315	E - 2	IC310	E - 1	Q117	J - 3	Q322	F - 3	TP107	L - 1	TP315	E - 3		
D101	K - 2			IC311	D - 3	Q118	K - 3	Q323	E - 3	TP108	K - 3	TP316	D - 1		
D102	L - 2	IC101	K - 5	IC312	E - 3	Q119	K - 3			TP109	H - 2	TP317	E - 2		
D103	K - 1	IC102	K - 4	IC313	D - 2	Q120	J - 4	RV101	M - 3	TP110	K - 2	TP318	E - 2		
D104	I - 3	IC103	K - 3	IC314	D - 1	Q301	A - 5	RV102	M - 2	TP111	I - 2	TP319	D - 4		
D105	I - 3	IC104	L - 2	IC315	D - 2	Q302	C - 4	RV103	I - 2	TP112	J - 1	TP320	E - 3		
D106	J - 3	IC105	J - 1	IC316	D - 1	Q303	C - 4	RV104	J - 2	TP113	I - 1	TP321	G - 3		
D107	J - 3	IC106	N - 1			Q304	D - 5	RV105	J - 2	TP114	I - 1	TP322	B - 2		
D108	H - 3	IC107	N - 2	Q101	K - 5	Q305	E - 5	RV301	A - 5	TP115	I - 2	TP323	B - 2		
D109	H - 4	IC108	M - 2	Q102	L - 3	Q306	F - 5	RV302	B - 5	TP116	M - 1	TP324	B - 4		
D110	K - 4	IC109	M - 1	Q103	L - 3	Q307	B - 4	RV303	B - 2	TP301	A - 5				
D111	K - 1	IC111	H - 3	Q104	L - 3	Q308	B - 4	RV304	C - 2	TP302	C - 4	TPE1	B - 2		
D112	J - 4	IC112	H - 2	Q105	K - 2	Q309	C - 4	RV305	F - 1	TP303	E - 5	TPE2	N - 2		
D301	A - 4	IC113	H - 4	Q106	K - 2	Q310	C - 4	RV306	A - 2	TP304	E - 5	TPE3	C - 5		

SV-59 (SLIDE SERVO)



SV-59 (SLIDE SERVO)





CN101	J - 4	D302	D - 5	IC114	H - 5	Q107	K - 4	Q311	C - 5	RV307	E - 2	TP305	E - 5	TPE4	L - 5
CN102	N - 1	D303	D - 5	IC301	A - 4	Q108	J - 1	Q312	B - 2	RV308	F - 3	TP306	B - 5	TPE5	I - 2
CN103	N - 2	D306	B - 5	IC302	D - 4	Q109	H - 3	Q313	C - 2	RV309	E - 3	TP307	A - 2	TPE6	H - 4
CN104	L - 1	D307	B - 5	IC303	B - 3	Q110	I - 5	Q314	G - 2			TP308	C - 2	TPE7	B - 4
CN105	I - 2	D308	D - 5	IC304	B - 2	Q111	I - 5	Q315	G - 2	TP101	L - 3	TP309	A - 2	TPE8	C - 4
CN106	I - 4	D309	C - 5	IC305	B - 1	Q112	J - 5	Q317	G - 5	TP102	L - 1	TP310	A - 2	TPH1	H - 5
CN301	A - 3	D310	A - 2	IC306	B - 1	Q113	I - 5	Q318	G - 5	TP103	I - 2	TP311	D - 3	TPG1	H - 4
CN302	E - 4	D311	C - 2	IC307	F - 1	Q114	J - 3	Q319	F - 3	TP104	I - 3	TP312	G - 2		
CN303	C - 3	D313	E - 2	IC308	G - 3	Q115	J - 3	Q320	F - 3	TP105	I - 3	TP313	G - 4		
CN304	C - 3	D314	F - 4	IC309	F - 2	Q116	J - 3	Q321	F - 4	TP106	J - 4	TP314	G - 2		
		D315	E - 2	IC310	E - 1	Q117	J - 3	Q322	F - 3	TP107	L - 1	TP315	E - 3		
D101	K - 2			IC311	D - 3	Q118	K - 3	Q323	E - 3	TP108	K - 3	TP316	D - 1		
D102	L - 2	IC101	K - 5	IC312	E - 3	Q119	K - 3			TP109	H - 2	TP317	E - 2		
D103	K - 1	IC102	K - 4	IC313	D - 2	Q120	J - 4	RV101	M - 3	TP110	K - 2	TP318	E - 2		
D104	I - 3	IC103	K - 3	IC314	D - 1	Q301	A - 5	RV102	M - 2	TP111	I - 2	TP319	D - 4		
D105	I - 3	IC104	L - 2	IC315	D - 2	Q302	C - 4	RV103	I - 2	TP112	J - 1	TP320	E - 3		
D106	J - 3	IC105	J - 1	IC316	D - 1	Q303	C - 4	RV104	J - 2	TP113	I - 1	TP321	G - 3		
D107	J - 3	IC106	N - 1			Q304	D - 5	RV105	J - 2	TP114	I - 1	TP322	B - 2		
D108	H - 3	IC107	N - 2	Q101	K - 5	Q305	E - 5	RV301	A - 5	TP115	I - 2	TP323	B - 2		
D109	H - 4	IC108	M - 2	Q102	L - 3	Q306	F - 5	RV302	B - 5	TP116	M - 1	TP324	B - 4		
D110	K - 4	IC109	M - 1	Q103	L - 3	Q307	B - 4	RV303	B - 2	TP301	A - 5				
D111	K - 1	IC111	H - 3	Q104	L - 3	Q308	B - 4	RV304	C - 2	TP302	C - 4	TPE1	B - 2		
D112	J - 4	IC112	H - 2	Q105	K - 2	Q309	C - 4	RV305	F - 1	TP303	E - 5	TPE2	N - 2		
D301	A - 4	IC113	H - 4	Q106	K - 2	Q310	C - 4	RV306	A - 2	TP304	E - 5	TPE3	C - 5		

CORRECTION AND ADDITION

Make the following correction and addition in your service manual.

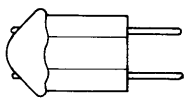
1. The list of Inductor and Connector are incorrect, use the following one.

Page 8-25

INDUCTOR

Parts that are not listed in the "reference numbers order list" are shown in following table.
Reference numbers are omitted.

MICRO INDUCTOR — **1 μH through 470 μH ±5%**



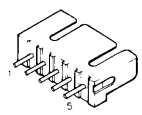
Parts No. 1-408-□□□-00

Value	Parts No. −□□□−	Value	Parts No. −□□□−	Value	Parts No. −□□□−	Value	Parts No. −□□□−
1 μH	397	4.7 μH	405	22 μH	413	100 μH	421
1.2	398	5.6	406	27	414	120	422
1.5	399	6.8	407	33	415	150	423
1.8	400	8.2	408	39	416	180	424
2.2	401	10	409	47	417	220	425
2.7	402	12	410	56	418	270	426
3.3	403	15	411	68	419	330	427
3.9	404	18	412	82	420	390	428
						470	429

CONNECTOR

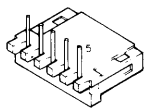
Parts that are not listed in the "reference numbers order list" are shown in following table.
Reference numbers are omitted.

top-type receptacle



2P	1-564-001-11
3P	002-00
4P	003-00
5P	004-00
6P	005-00
7P	006-11
8P	007-00
9P	008-00
10P	009-00
11P	010-11
12P	011-11
13P	
14P	069-00
15P	

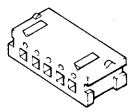
side-type receptacle



2P	1-564-012-00
3P	013-00
4P	014-00
5P	015-00
6P	016-00
7P	017-00
8P	018-11
9P	019-11
10P	020-00
11P	021-11
12P	022-00
13P	
14P	
15P	

plug

housing



2P	1-562-147-11
3P	148-11
4P	149-11
5P	150-11
6P	151-11
7P	152-11
8P	153-11
9P	154-11
10P	155-11
11P	156-11
12P	157-11
13P	
14P	185-00
15P	

contact

1-564-026-21

CARBON RESISTOR

Parts that are not listed in the "reference numbers order list" are shown in following table.
Reference numbers are omitted.

CARBON RESISTOR (1/6W)

±5%, 1/6W, non-special type
2.2Ω through 1MΩ

Parts No. 1-247-□□□-00

Value	Parts No. −□□□−
1Ω	−
1.1	−
1.2	−
1.3	−
1.5	−
1.6	−
1.8	−
2	−
2.2	767
2.4	768
2.7	769
3	770
3.3	771
3.6	772
3.9	773
4.3	774
4.7	775
5.1	776
5.6	777
6.2	778
6.8	779
7.5	780
8.2	781
9.1	782
10Ω	783
11	784
12	785
13	786
15	787
16	788
18	789
20	790
22	791
24	792
27	793
30	794
33	795

Value	Parts No. −□□□−
36Ω	796
39	797
43	798
47	799
51	800
56	801
62	802
68	803
75	804
82	805
91	806
100Ω	807
110	808
120	809
130	810
150	811
160	812
180	813
200	814
220	815
240	816
270	817
300	818
330	819
360	820
390	821
430	822
470	823
510	824
560	825
620	826
680	827
750	828
820	829
910	830
1kΩ	831
1.1	832

Value	Parts No. −□□□−
1.2kΩ	833
1.3	834
1.5	835
1.6	836
1.8	837
2	838
2.2	839
2.4	840
2.7	841
3	842
3.3	843
3.6	844
3.9	845
4.3	846
4.7	847
5.1	848
5.6	849
6.2	850
6.8	851
7.5	852
8.2	853
9.1	854
10kΩ	855
11	856
12	857
13	858
15	859
16	860
18	861
20	862
22	863
24	864
27	865
30	866
33	867
36	868
39	869

Value	Parts No. −□□□−
43kΩ	870
47	871
51	872
56	873
62	874
68	875
75	876
82	877
91	878
100kΩ	879
110	880
120	881
130	882
150	883
160	884
180	885
200	886
220	887
240	888
270	889
300	890
330	891
360	892
390	893
430	894
470	895
510	896
560	897
620	898
680	899
750	900
820	901
910	902
1MΩ	903

LDP-2000

SONY

SERVICE MANUAL

US Model
Canadian Model

August, 1986

SUPPLEMENT-3

1. Periodic checks and maintenance for LDP-2000
2. Method to judge whether good or no of SY-30 board
3. The printed wiring board has been changed.
   The last digits of part No. has been changed.
   - SV-69 Board - 14
   - SA-16 Board - 15
   - SY-30 Board - 13

VIDEO

1. Periodic checks and maintenance for LDP-2000

For full display of the functions and performance of the set and for the longest service life of the machine, execution of the following maintenance and periodic checks is recommended.

1. Periodic check items

   Carry out periodic checks on the items in separate paragraphs according to the length of time used.

   Note: After periodic checks, be careful to confirm the adjusted safety switch position which are described in Item 3-4 of service manual.

2. Maintenance after periodic checks or repairing of the set.

   Execute cleaning of the following positions after periodic checks or set-repairing irrespective of the length of time of use.

   (1) Object lens/SKEW lens

   Remove video disc and blow off the dust on the object lens and SKEW lens with the blower-brush or sweep them with soft cloth.

   (2) Disc tray section

   Remove video disc and sweep the tray of the disc with soft cloth.

   (3) Sweeping clean the disc surface

   When there seems dust on the disc, sweep the disc surface with soft cloth. No alcohol or no other chemicals should be used.

3. Please arrange in accordance with the Service Manual for the treatment after parts-replacement or repair work.

Items for periodic checks and maintenance

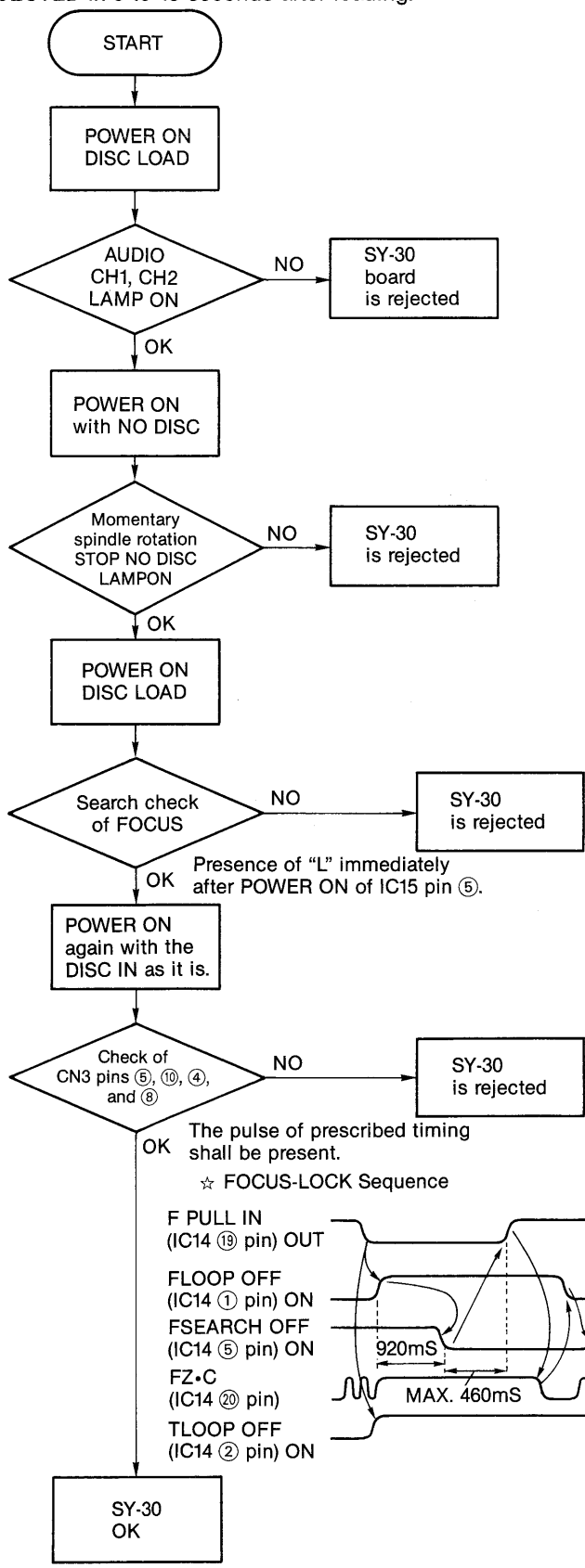
◇ : Checking ◆ : Replacement

Operation time (H) / Item/Part No.	5,000	10,000	Remarks
Slide motor X-3705-058-	◆	◆	
Spindle motor 8-838-084-	◇ *1	◆	*1 Replace the motor with a new one when spindle motor makes rotational noise.
Brake band A-6491-020-	◇ *2	◇ *2	*2 Replace the brake shoe with a new one when it has abnormal abrasion.
Loading motor 8-835-055-	◇	◇	
Optical block 8-848-011-	—	◇ or ◆ *3	*3 Confirm it is within the specified value by checking Iop in "4-2-4" of the Service Manual.
FL assembly loading belt	◇	◇	

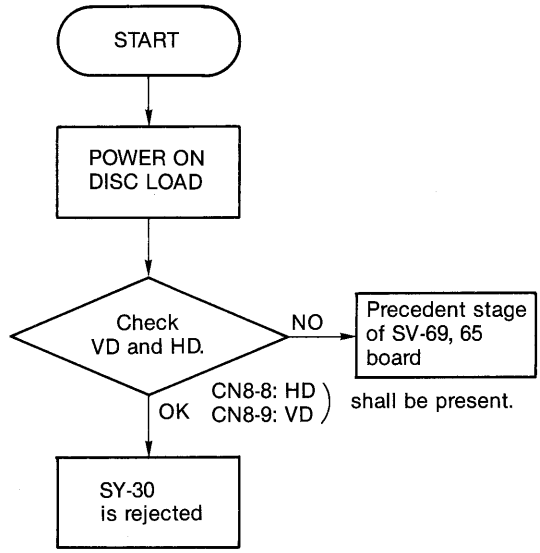
Note: Service life of the motor depends largely on the ambience and ways of use.

2. Method to judge whether good or no of SY-30 board (No DB board)

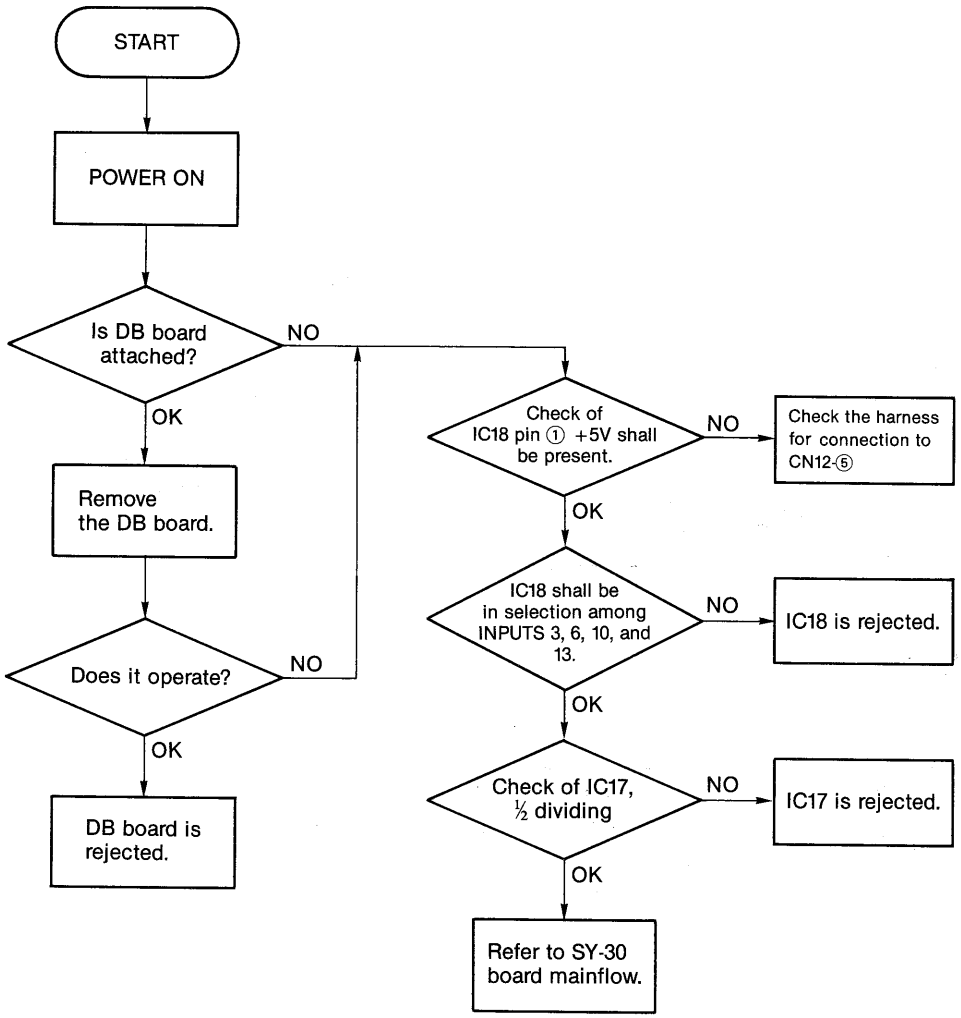
No picture shows up though DISC is loaded.
EJECTED in 5 to 15 seconds after loading.



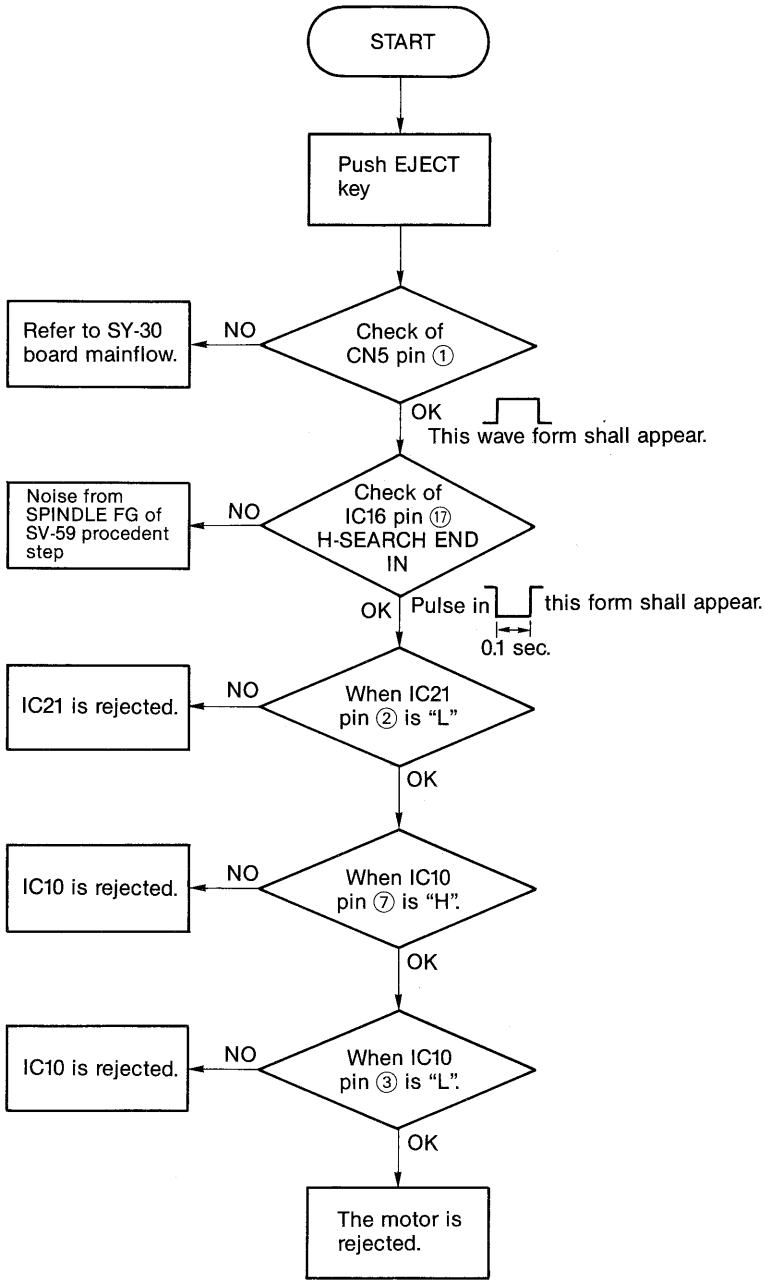
No picture shows up though DISC is loaded.
EJECTED in 15~30 seconds after loading.



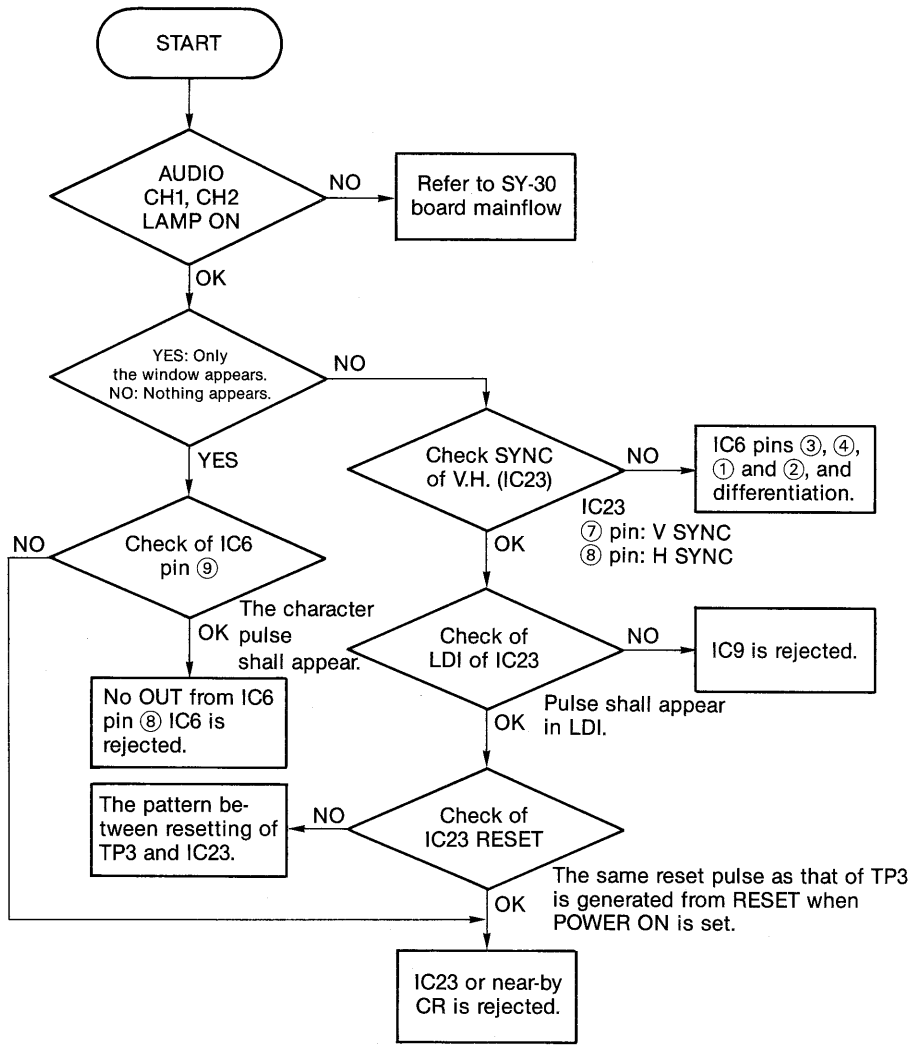
Absolutely no operation



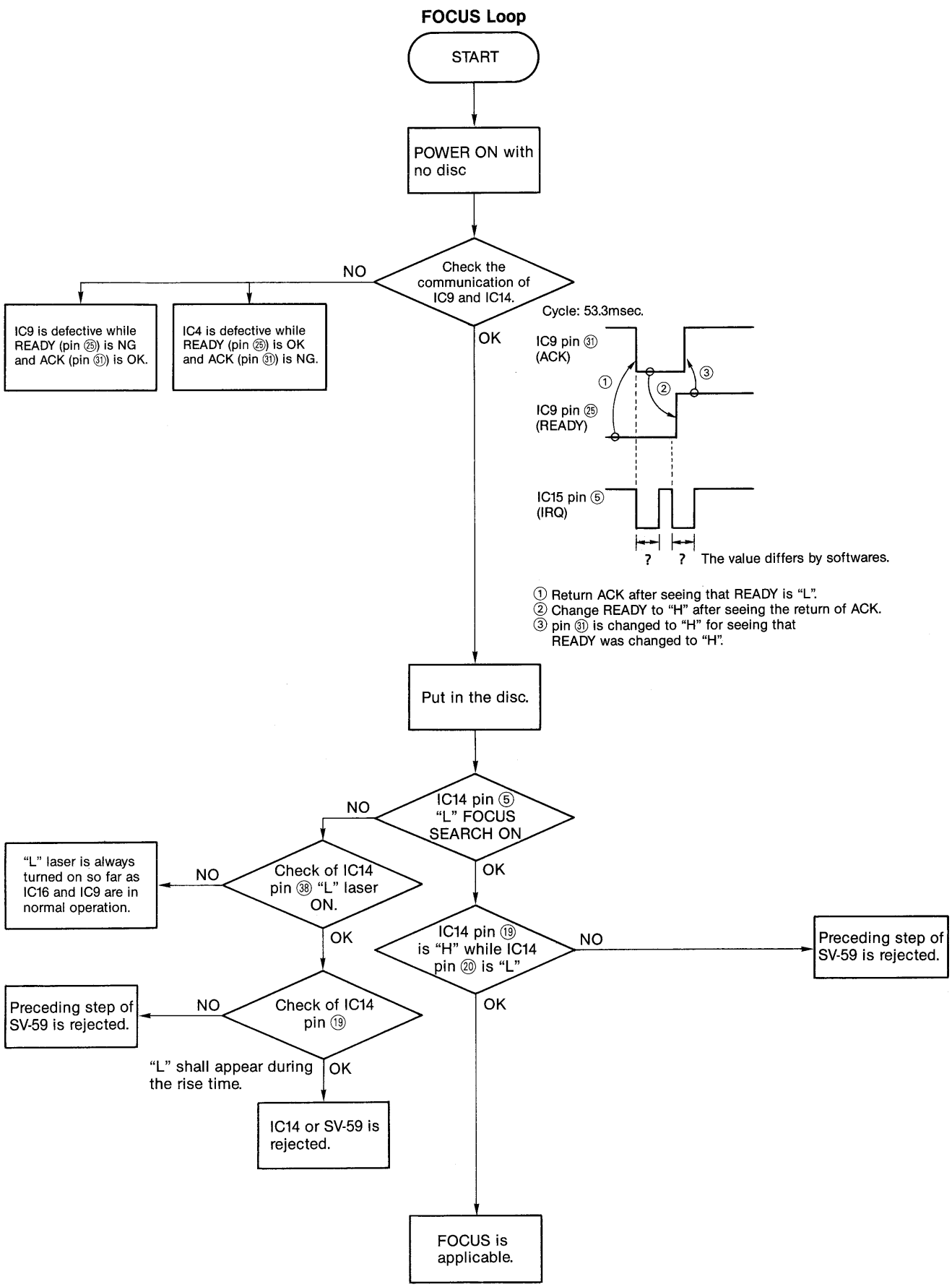
STAND BY LAMP lights up without UNLOADING



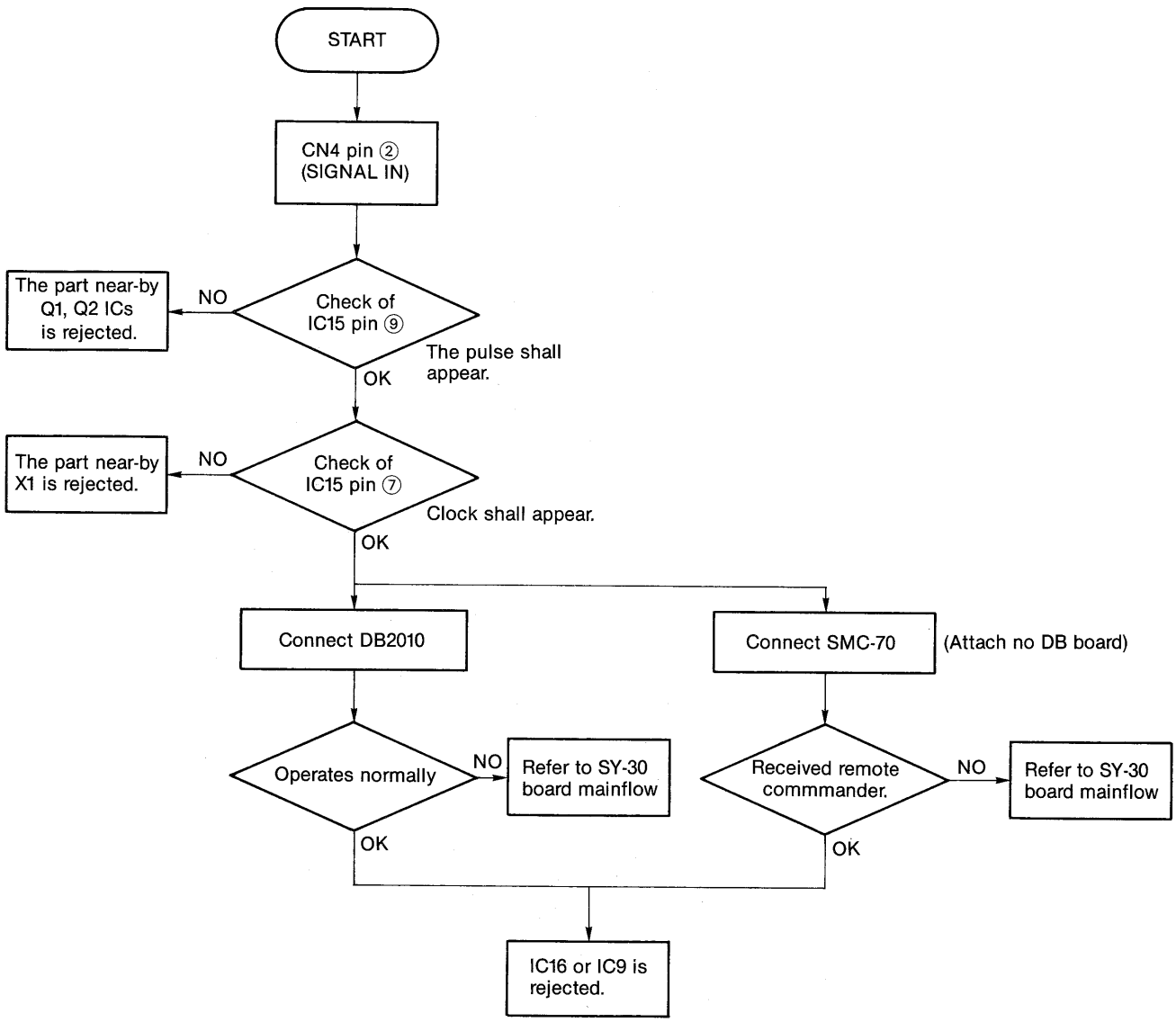
No INDEX shows up


START
AUDIO CH1, CH2 LAMP ON
NO
Refer to SY-30 board mainflow
OK
YES: Only the window appears. NO: Nothing appears.
NO
YES
Check SYNC of V.H. (IC23)
NO
IC6 pins ③, ④, ① and ②, and differentiation.
IC23 ⑦ pin: V SYNC ⑧ pin: H SYNC
OK
NO
Check of IC6 pin ⑨
OK
The character pulse shall appear.
Check of LDI of IC23
NO
IC9 is rejected.
No OUT from IC6 pin ⑧ IC6 is rejected.
Pulse shall appear in LDI.
OK
The pattern between resetting of TP3 and IC23.
NO
Check of IC23 RESET
The same reset pulse as that of TP3 is generated from RESET when POWER ON is set.
OK
IC23 or near-by CR is rejected.

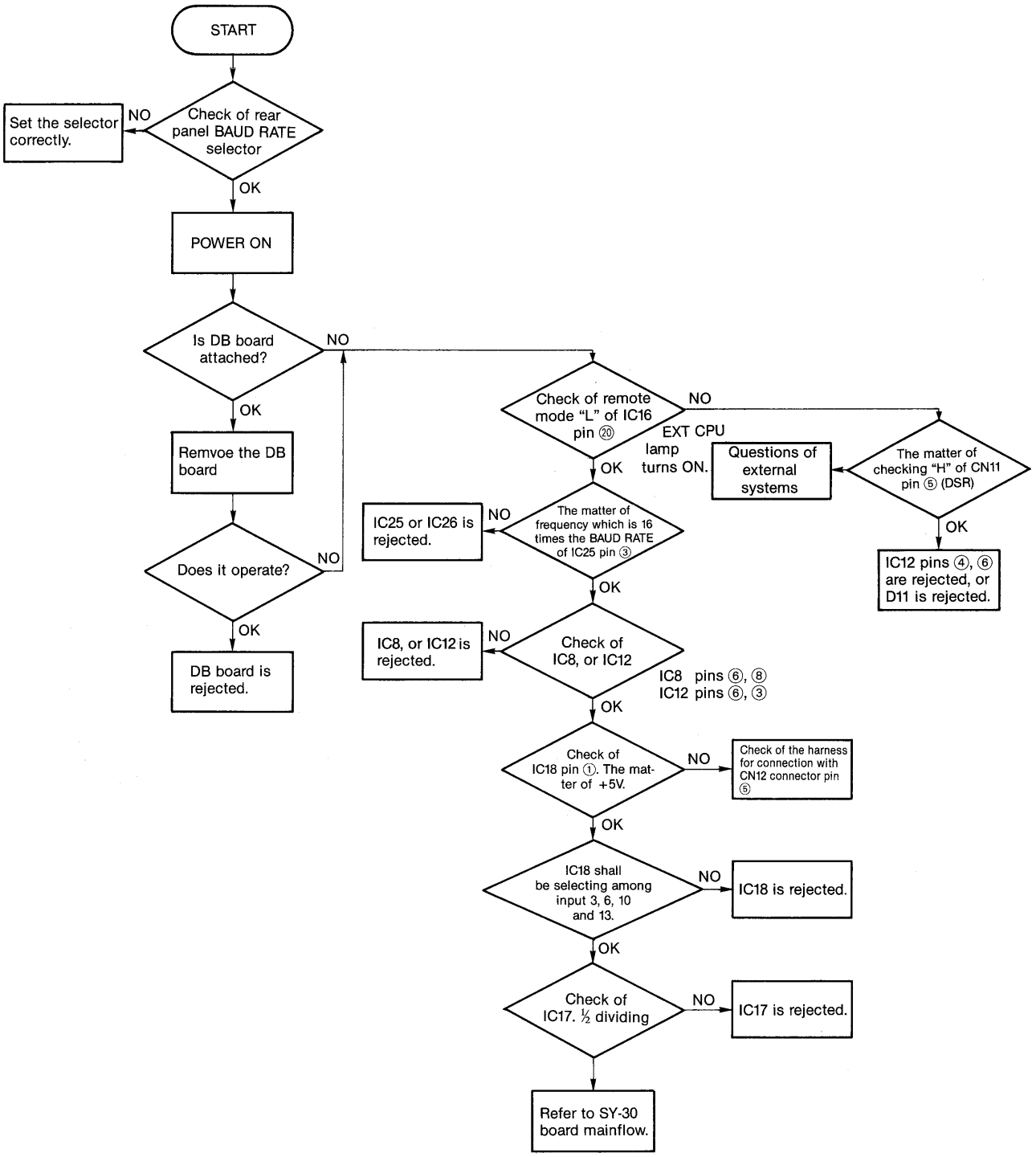
FOCUS Loop


START
POWER ON with no disc
Check the communication of IC9 and IC14.
NO
IC9 is defective while READY (pin ㉕) is NG and ACK (pin ㉛) is OK.
IC4 is defective while READY (pin ㉕) is OK and ACK (pin ㉛) is NG.
OK
Cycle: 53.3msec.
IC9 pin ㉛ (ACK)
IC9 pin ㉕ (READY)
IC15 pin ⑤ (IRQ)
① ② ③
? ?
The value differs by softwares.
① Return ACK after seeing that READY is "L".
② Change READY to "H" after seeing the return of ACK.
③ pin ㉛ is changed to "H" for seeing that READY was changed to "H".
Put in the disc.
IC14 pin ⑤ "L" FOCUS SEARCH ON
NO
OK
Check of IC14 pin ㊳ "L" laser ON.
NO
"L" laser is always turned on so far as IC16 and IC9 are in normal operation.
OK
IC14 pin ⑲ is "H" while IC14 pin ⑳ is "L"
NO
Preceding step of SV-59 is rejected.
OK
Check of IC14 pin ⑲
NO
Preceding step of SV-59 is rejected.
"L" shall appear during the rise time.
OK
IC14 or SV-59 is rejected.
FOCUS is applicable.

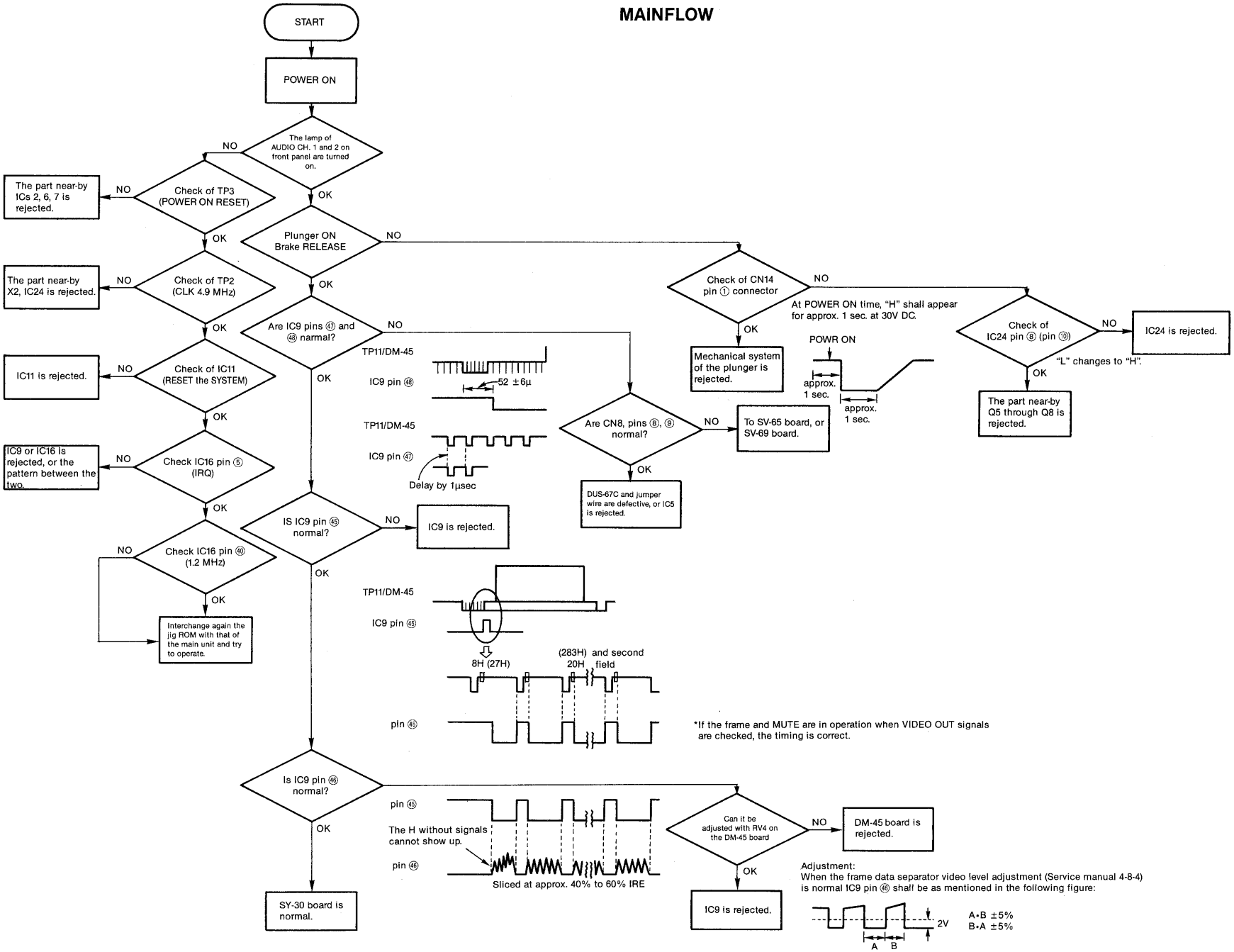
No REMOTE Commander Reception



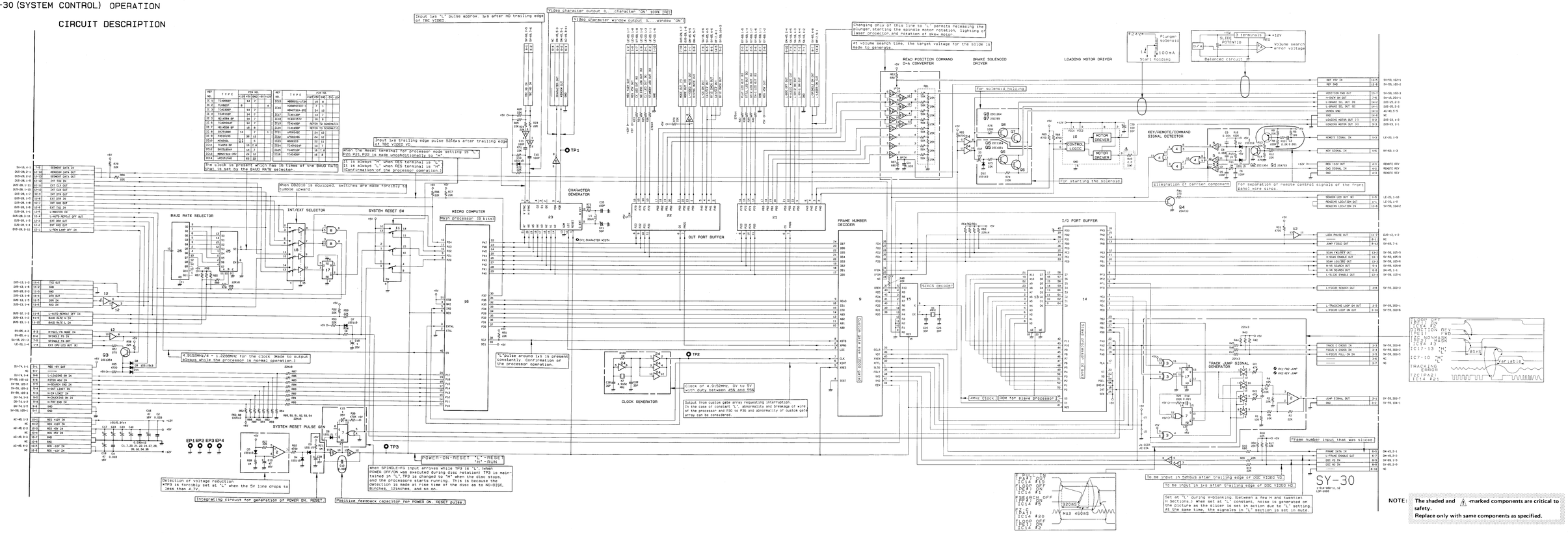
Failure to communicate with EXT CPU by RS232C



MAINFLOW


START
POWER ON
The lamp of AUDIO CH. 1 and 2 on front panel are turned on.
NO
OK
Check of TP3 (POWER ON RESET)
The part near-by ICs 2, 6, 7 is rejected.
Check of TP2 (CLK 4.9 MHz)
The part near-by X2, IC24 is rejected.
Check of IC11 (RESET the SYSTEM)
IC11 is rejected.
Check IC16 pin ⑤ (IRQ)
IC9 or IC16 is rejected, or the pattern between the two.
Check IC16 pin ㊵ (1.2 MHz)
Interchange again the jig ROM with that of the main unit and try to operate.
Plunger ON Brake RELEASE
Are IC9 pins ㊼ and ㊽ narmal?
IS IC9 pin ㊺ normal?
IC9 is rejected.
Is IC9 pin ㊻ normal?
SY-30 board is normal.
TP11/DM-45
IC9 pin ㊽
52 ±6µ
IC9 pin ㊼
Delay by 1µsec
pin ㊺
8H (27H)
(283H) and second 20H field
pin ㊻
The H without signals cannot show up.
Sliced at approx. 40% to 60% IRE
*If the frame and MUTE are in operation when VIDEO OUT signals are checked, the timing is correct.
Check of CN14 pin ① connector
Mechanical system of the plunger is rejected.
At POWER ON time, "H" shall appear for approx. 1 sec. at 30V DC.
POWR ON
approx. 1 sec.
approx. 1 sec.
Check of IC24 pin ⑧ (pin ⑩)
"L" changes to "H".
IC24 is rejected.
The part near-by Q5 through Q8 is rejected.
Are CN8, pins ⑧, ⑨ normal?
To SV-65 board, or SV-69 board.
DUS-67C and jumper wire are defective, or IC5 is rejected.
Can it be adjusted with RV4 on the DM-45 board
DM-45 board is rejected.
IC9 is rejected.
Adjustment:
When the frame data separator video level adjustment (Service manual 4-8-4) is normal IC9 pin ㊻ shall be as mentioned in the following figure:
2V
A
B
A•B ±5%
B•A ±5%

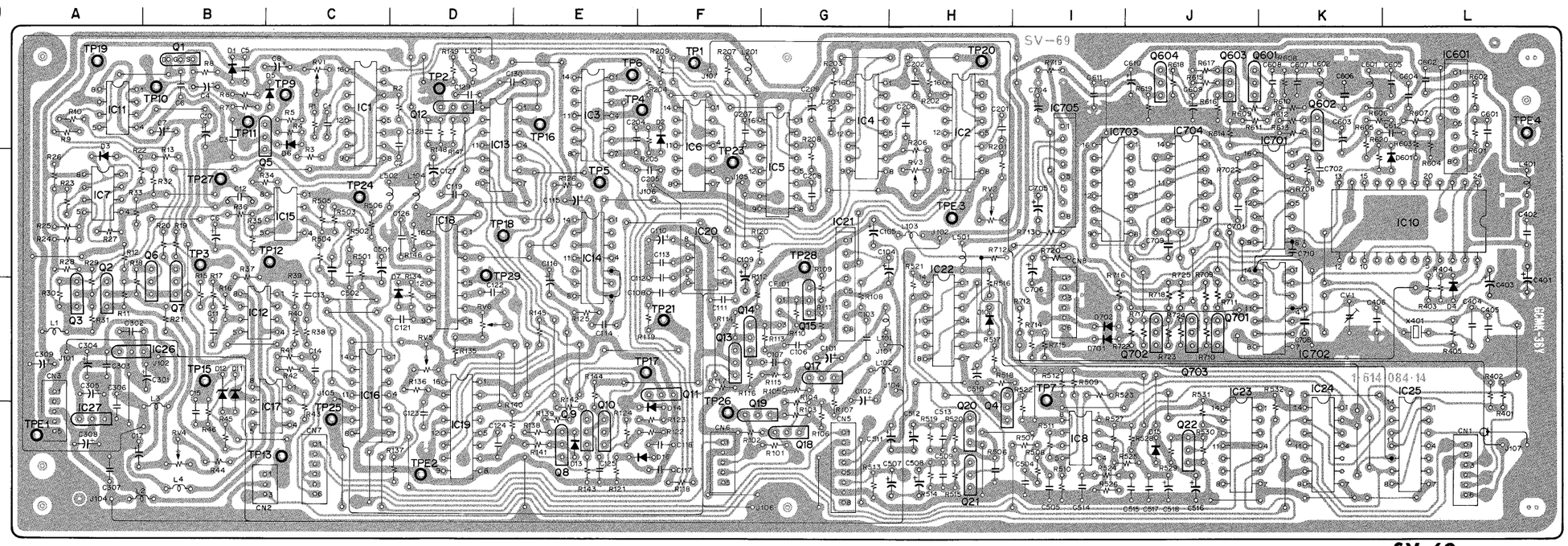
CIRCUIT DESCRIPTION


Input 1µs "L" pulse approx. 1µs after H0 trailing edge of TBC VIDEO.
Video character output "L" ... character "ON" (100% IRE)
Video character window output "L" ... window "ON"
Changing only of this line to "L" permits releasing the plunger, starting the spindle motor rotation, lighting of laser projector, and rotation of skew motor.
At volume search time, the target voltage for the slide is made to generate.
READ POSITION COMMAND D-A CONVERTER
BRAKE SOLENOID DRIVER
LOADING MOTOR DRIVER
Plunger solenoid
100mA
Start holding
3 terminals
POTENTIO
Balanced circuit
volume search error voltage
For solenoid holding
For starting the solenoid
MOTOR DRIVER
CONTROL LOGIC
KEY/REMOTE/COMMAND SIGNAL DETECTOR
Elimination of carrier component
For separation of remote control signals of the front panel wire lines
REF +5V IN
REF GND
POSITION GND OUT
V-BRAKE SL OUT
L-BRAKE SL OUT
SPEED SL OUT
LOADING MOTOR OUT (+)
LOADING MOTOR OUT (-)
REMOTE SIGNAL IN
KEY SIGNAL IN
RES +12V OUT
CMD SIGNAL IN
GND
SENSOR LED OUT (K)
READING LOCATION OUT
READING LOCATION IN
REF +5V IN
REF GND
V-BRAKE SL OUT
L-BRAKE SL OUT
SPEED SL OUT
LOADING MOTOR OUT (+)
LOADING MOTOR OUT (-)
REMOTE SIGNAL IN
KEY SIGNAL IN
RES +12V OUT
CMD SIGNAL IN
GND
SENSOR LED OUT (K)
READING LOCATION OUT
READING LOCATION IN
LOCK PULSE OUT
JUMP FIELD OUT
SCAN FAILURE OUT
H-SCAN ENABLE OUT
SCAN LOCATION OUT
H-PB SEARCH OUT
L-PB/DR ENABLE OUT
L-FIELD SEARCH OUT
L-TRACKING LOOP SW OUT
L-FIELD LOOP SW OUT
TRACK C CHOSS IN
FIELD C CHOSS IN
H-FIELD PULL-IN IN
JUMP SIGNAL OUT
GND
FRAME DATA IN
L-FRAME ENABLE OUT
DOC V2 IN
DOC V4 IN
Frame number input that was sliced.
To be input in 52µs after trailing edge of DOC VIDEO V2
To be input in 1µs after trailing edge of DOC VIDEO H2
Set at "L" during V-blanking. (between a few H and twentieth H Sections.) When set at "L" constant, noise is generated on the picture as the slicer is set in action due to "L" setting. At the same time, the signals in "L" section is set in mute.
SY-30
1-614-080-11, 12
(J/P-1000)
NOTE: The shaded and ⚠ -marked components are critical to safety.
Replace only with same components as specified.
REF NO. | TYPE | PCB NO. +12V | +5V | GND | -5V | -12V
IC 1 TC4069UP 14 7
IC 2 TL062CP 8 4
IC 3 TC4030BP 14 7
IC 4 TC4011BP 14 7
IC 5 HD14584 BP 14 7
IC 6 TC4093BP 14 7
IC 7 HD14538 BP 16 8
IC 8 SN7518AN 14 7
IC 9 CXD1019Q 20 10
IC10 M54543L 2,3 5
IC11 TC4053 BP 16 7, 8
IC12 SN75188AN 14 7
IC13 M5M27256-25P 24 12
IC14 µPD37C66 8,9 20
REF NO. | TYPE | PCB NO. +12V | +5V | GND | -5V | -12V
IC15 M5M5011-12P 18 9
IC16 HD6897002 C 7 1
M5M27256-25C 24 12
IC17 TC4013BP 14 7
IC18 TC4001BP 14 8
IC19 TC4049BP REFER TO SCHEMATIC
IC20 TC4069BP REFER TO SCHEMATIC
IC21 µPD4030C 24 12
IC22 µPD4042C 24 12
IC23 M5M80303 22 11
IC24 TC4040AP 14 7
IC25 TC4051BP 16 8
IC26 TC4030BP 14 7
Q1 2SC1384
Q2 2SC1384
Q3 2SC1384
Q4 2SA733
Q5 2SC1384
Q6 2SC1384
Q7 2SD789
Q8 2SC1384
Q9 2SC1384
Q10 2SC1384
Q11 2SA733
Q12 2SC1384
Q13 2SA733
Q14 2SC1384
Q15 2SA733
Q16 2SC1384
Q17 2SA733
Q18 2SC1384
Q19 2SA733
Q20 2SC1384
Q21 2SA733
Q22 2SC1384
Q23 2SA733
Q24 2SC1384
Q25 2SA733
Q26 2SC1384
Q27 2SA733
Q28 2SC1384
Q29 2SA733

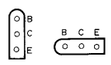
3. The printed wiring boards have been changed.

PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

SV-69 (TBC)

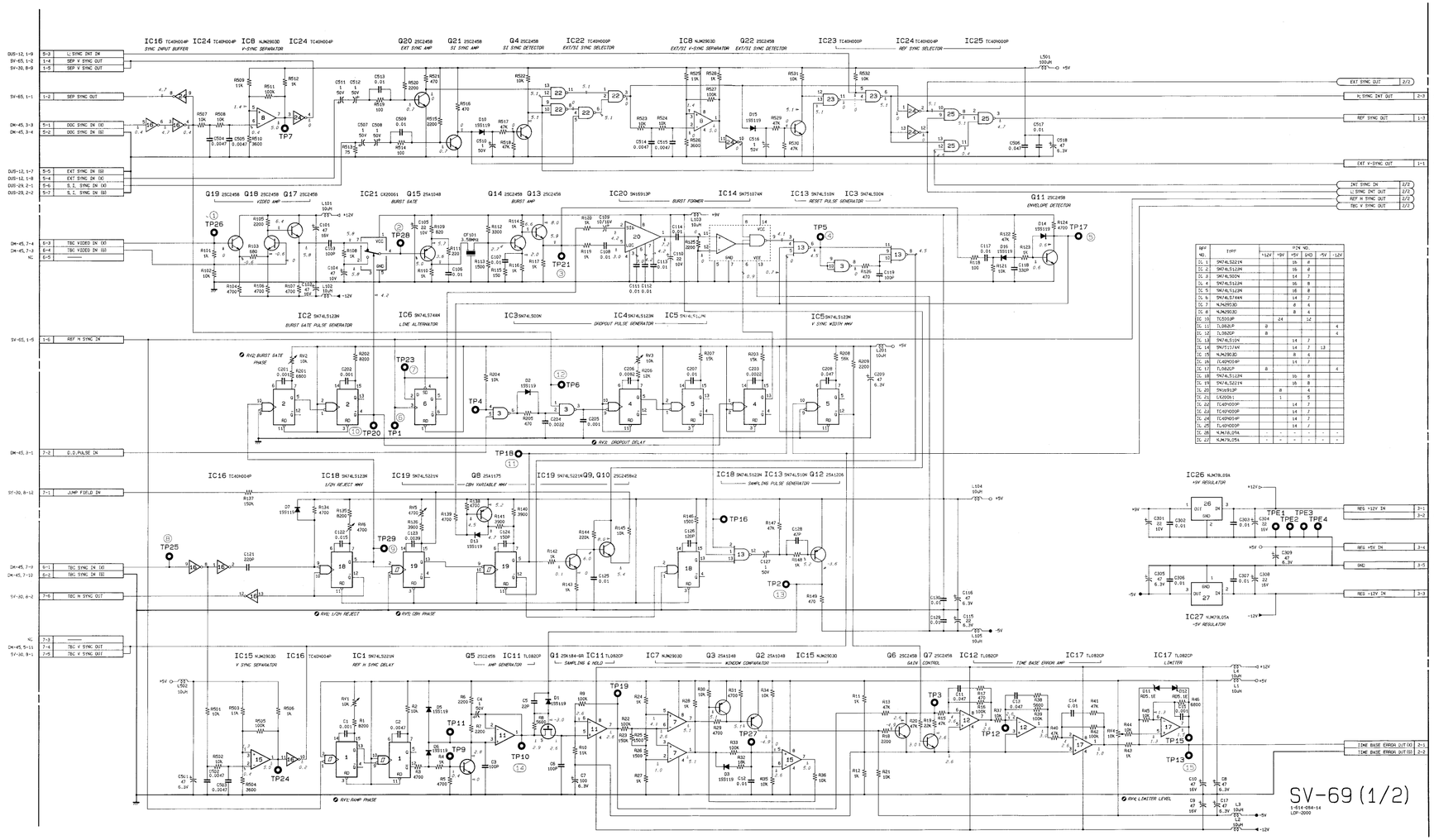


SV-69 –SOLDERING SIDE–
1–614–084–14
LDP–2000



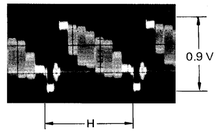
CF101	G · 3	D701	I · 3	IC26	A · 3	Q20	H · 4	TP12	C · 2
		D702	I · 3	IC27	A · 4	Q21	H · 4	TP13	C · 4
CN1	L · 4			IC601	L · 1	Q22	J · 4	TP15	B · 3
CN2	B · 4	IC1	C · 1	IC701	K · 2	Q601	J · 1	TP16	E · 1
CN3	A · 3	IC2	H · 1	IC702	K · 3	Q602	K · 1	TP17	F · 3
CN5	G · 4	IC3	E · 1	IC703	I · 2	Q603	J · 1	TP18	D · 2
CN6	F · 4	IC4	G · 1	IC704	J · 2	Q604	J · 1	TP19	A · 1
CN7	C · 4	IC5	G · 2	IC705	I · 1	Q701	J · 3	TP20	H · 1
CN8	I · 3	IC6	F · 1			Q702	J · 3	TP21	F · 3
		IC7	A · 2	Q1	B · 1	Q703	J · 3	TP23	F · 2
CV1	K · 3	IC8	I · 4	Q2	A · 3			TP24	C · 2
		IC10	L · 2	Q3	A · 3	RV1	C · 1	TP25	C · 4
D1	B · 1	IC11	A · 1	Q4	H · 4	RV2	H · 2	TP26	F · 4
D2	F · 1	IC12	B · 3	Q5	B · 1	RV3	H · 2	TP27	B · 2
D3	A · 2	IC13	D · 1	Q6	B · 3	RV4	B · 4	TP28	G · 2
D4	L · 3	IC14	E · 2	Q7	B · 3	RV5	D · 3	TP29	D · 3
D5	C · 1	IC15	C · 2	Q8	E · 4	RV6	D · 3		
D6	C · 1	IC16	C · 3	Q9	E · 4			TPE1	A · 4
D7	D · 3	IC17	C · 4	Q10	E · 4	TP1	F · 1	TPE2	D · 4
D10	H · 3	IC18	D · 2	Q11	F · 3	TP2	D · 1	TPE3	H · 2
D11	B · 3	IC19	D · 4	Q12	D · 1	TP3	B · 2	TPE4	L · 1
D12	B · 3	IC20	F · 2	Q13	F · 3	TP4	F · 1		
D13	E · 4	IC21	G · 2	Q14	F · 3	TP5	E · 2	X401	L · 3
D14	F · 4	IC22	H · 3	Q15	G · 3	TP6	E · 1		
D15	J · 4	IC23	J · 4	Q17	G · 3	TP7	I · 3		
D16	F · 4	IC24	K · 4	Q18	G · 4	TP9	C · 1		
D601	L · 1	IC25	L · 4	Q19	F · 4	TP10	B · 1		
						TP11	B · 1		

SV-69 (TBC)



REF NO.	TYPE	PIN NO. +12V	+9V	+5V	GND	-5V	-12V
IC 1	SN74LS221N			16	8		
IC 2	SN74LS123N			16	8		
IC 3	SN74LS00N			14	7		
IC 4	SN74LS123N			16	8		
IC 5	SN74LS123N			16	8		
IC 6	SN74LS74AN			14	7		
IC 7	NJM2903D			8	4		
IC 8	NJM2903D			8	4		
IC 10	TC5003P		24		12		
IC 11	TL082CP	8					4
IC 12	TL082CP	8					4
IC 13	SN74LS10N			14	7		
IC 14	SM5107AN			14	7	13	
IC 15	NJM2903D			8	4		
IC 16	TC4W04P			14	7		
IC 17	TL082CP	8					4
IC 18	SN74LS123N			16	8		
IC 19	SN74LS221N			16	8		
IC 20	SN16913P		8		4		
IC 21	CX20061		1		5		
IC 22	TC4W00P			14	7		
IC 24	TC4W04P			14	7		
IC 25	TC4W00P			14	7		
IC 26	NJM78L05A	-	-	-	-	-	
IC 27	NJM79L05A	-	-	-	-	-	

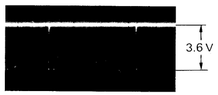
① TP26



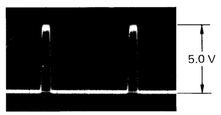
② TP28

③ TP21

④ TP5

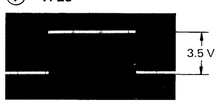


⑤ TP17

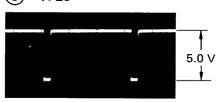


⑥ TP1

⑦ TP23



⑧ TP25



⑨ TP29

⑩ TP20

⑪ TP18

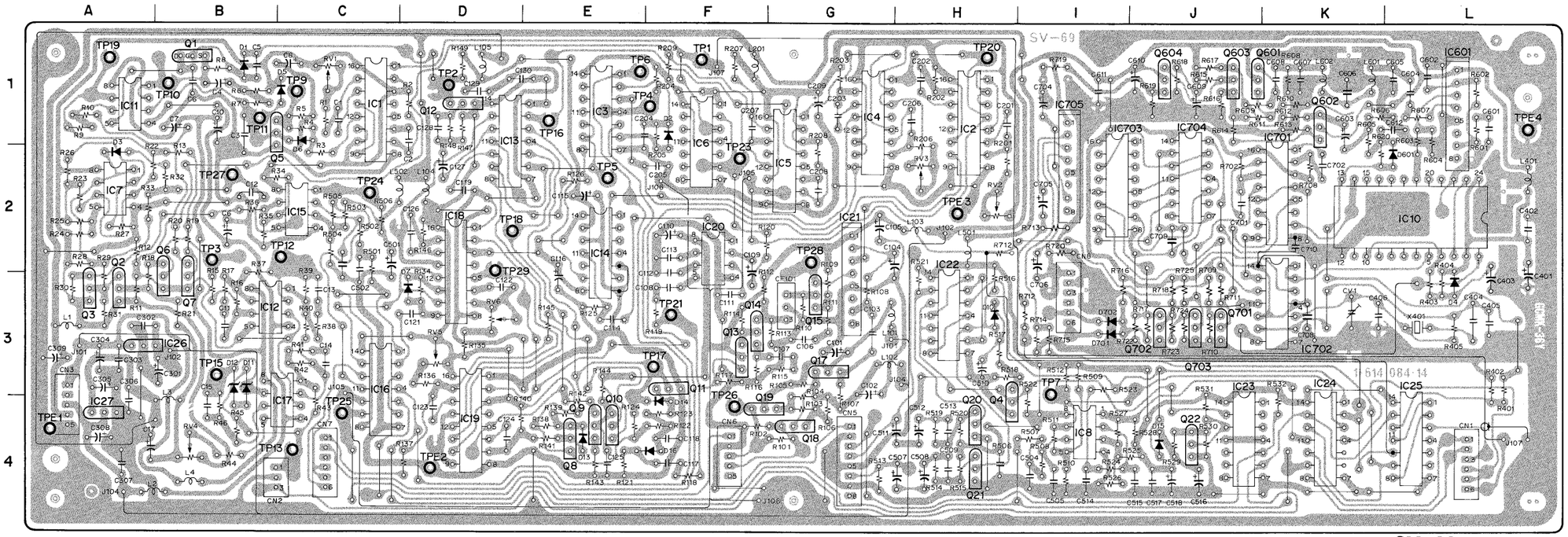
⑫ TP6

⑬ TP2

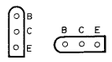
⑭ TP10

⑮ TP13

SV-69 (TBC)

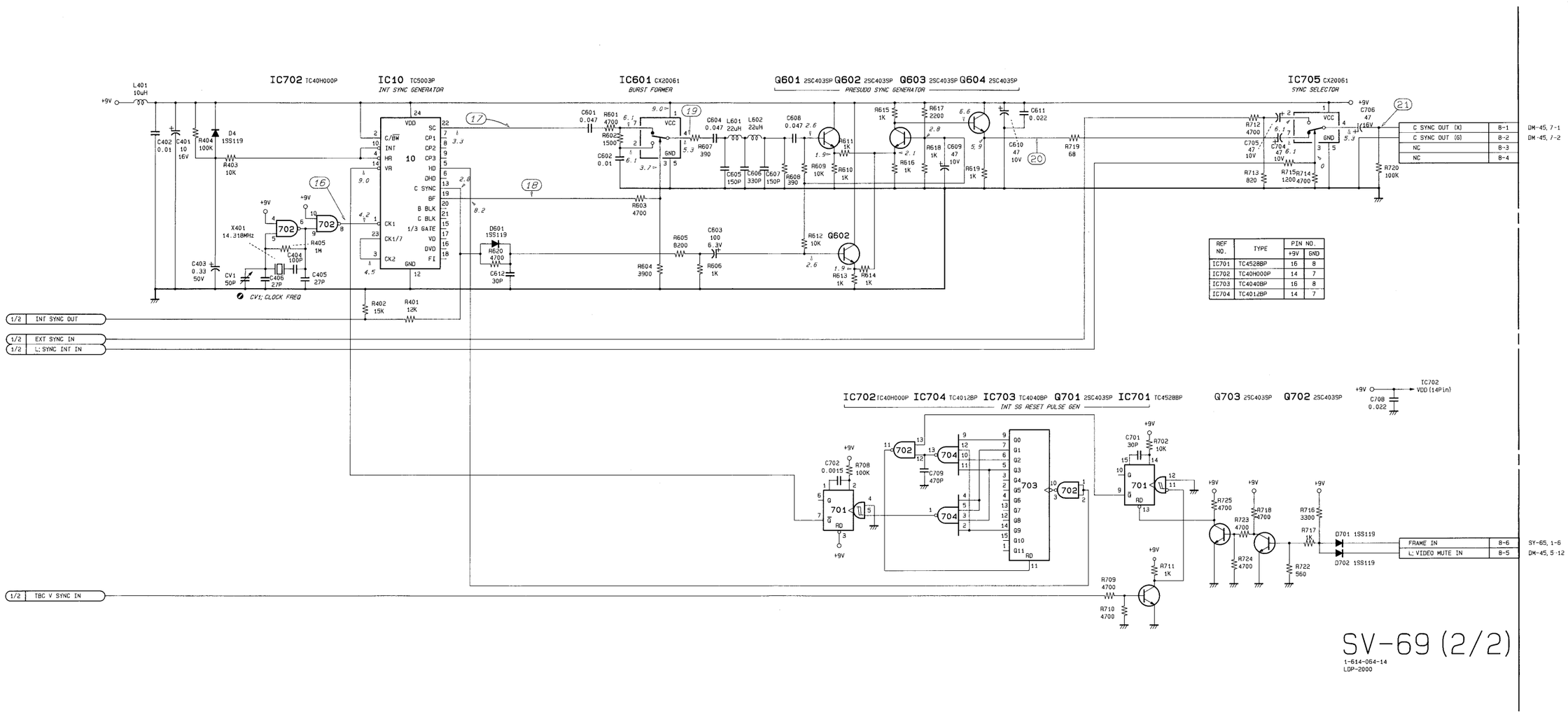


SV-69 -SOLDERING SIDE-
1-614-084-14
LDP-2000



CF101	G · 3	D701	I · 3	IC26	A · 3	Q20	H · 4	TP12	C · 2
		D702	I · 3	IC27	A · 4	Q21	H · 4	TP13	C · 4
CN1	L · 4			IC601	L · 1	Q22	J · 4	TP15	B · 3
CN2	B · 4	IC1	C · 1	IC701	K · 2	Q601	J · 1	TP16	E · 1
CN3	A · 3	IC2	H · 1	IC702	K · 3	Q602	K · 1	TP17	F · 3
CN5	G · 4	IC3	E · 1	IC703	I · 2	Q603	J · 1	TP18	D · 2
CN6	F · 4	IC4	G · 1	IC704	J · 2	Q604	J · 1	TP19	A · 1
CN7	C · 4	IC5	G · 2	IC705	I · 1	Q701	J · 3	TP20	H · 1
CN8	I · 3	IC6	F · 1			Q702	J · 3	TP21	F · 3
		IC7	A · 2	Q1	B · 1	Q703	J · 3	TP23	F · 2
CV1	K · 3	IC8	I · 4	Q2	A · 3			TP24	C · 2
		IC10	L · 2	Q3	A · 3	RV1	C · 1	TP25	C · 4
D1	B · 1	IC11	A · 1	Q4	H · 4	RV2	H · 2	TP26	F · 4
D2	F · 1	IC12	B · 3	Q5	B · 1	RV3	H · 2	TP27	B · 2
D3	A · 2	IC13	D · 1	Q6	B · 3	RV4	B · 4	TP28	G · 2
D4	L · 3	IC14	E · 2	Q7	B · 3	RV5	D · 3	TP29	D · 3
D5	C · 1	IC15	C · 2	Q8	E · 4	RV6	D · 3		
D6	C · 1	IC16	C · 3	Q9	E · 4			TPE1	A · 4
D7	D · 3	IC17	C · 4	Q10	E · 4	TP1	F · 1	TPE2	D · 4
D10	H · 3	IC18	D · 2	Q11	F · 3	TP2	D · 1	TPE3	H · 2
D11	B · 3	IC19	D · 4	Q12	D · 1	TP3	B · 2	TPE4	L · 1
D12	B · 3	IC20	F · 2	Q13	F · 3	TP4	F · 1		
D13	E · 4	IC21	G · 2	Q14	F · 3	TP5	E · 2	X401	L · 3
D14	F · 4	IC22	H · 3	Q15	G · 3	TP6	E · 1		
D15	J · 4	IC23	J · 4	Q17	G · 3	TP7	I · 3		
D16	F · 4	IC24	K · 4	Q18	G · 4	TP9	C · 1		
D601	L · 1	IC25	L · 4	Q19	F · 4	TP10	B · 1		
						TP11	B · 1		

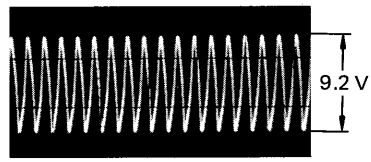
SV-69 (SYNC GENERATOR)



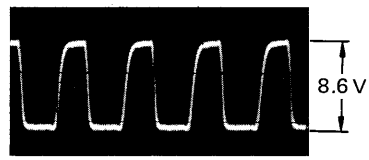
SV-69 (2/2)

1-614-064-14
LDP-2000

⑯ IC 10-1

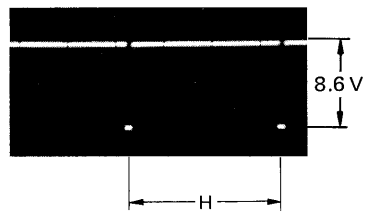


⑰ IC 10-22

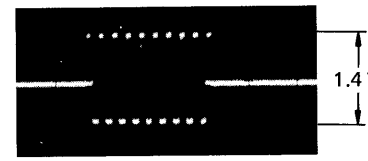


3.58 MHz

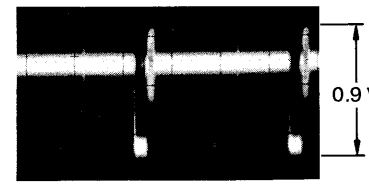
⑱ IC 10-19



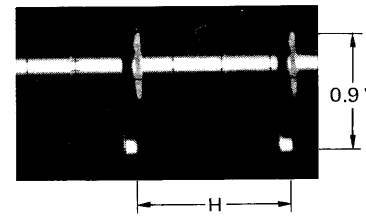
⑲ IC 1-4



⑳ Q4-E

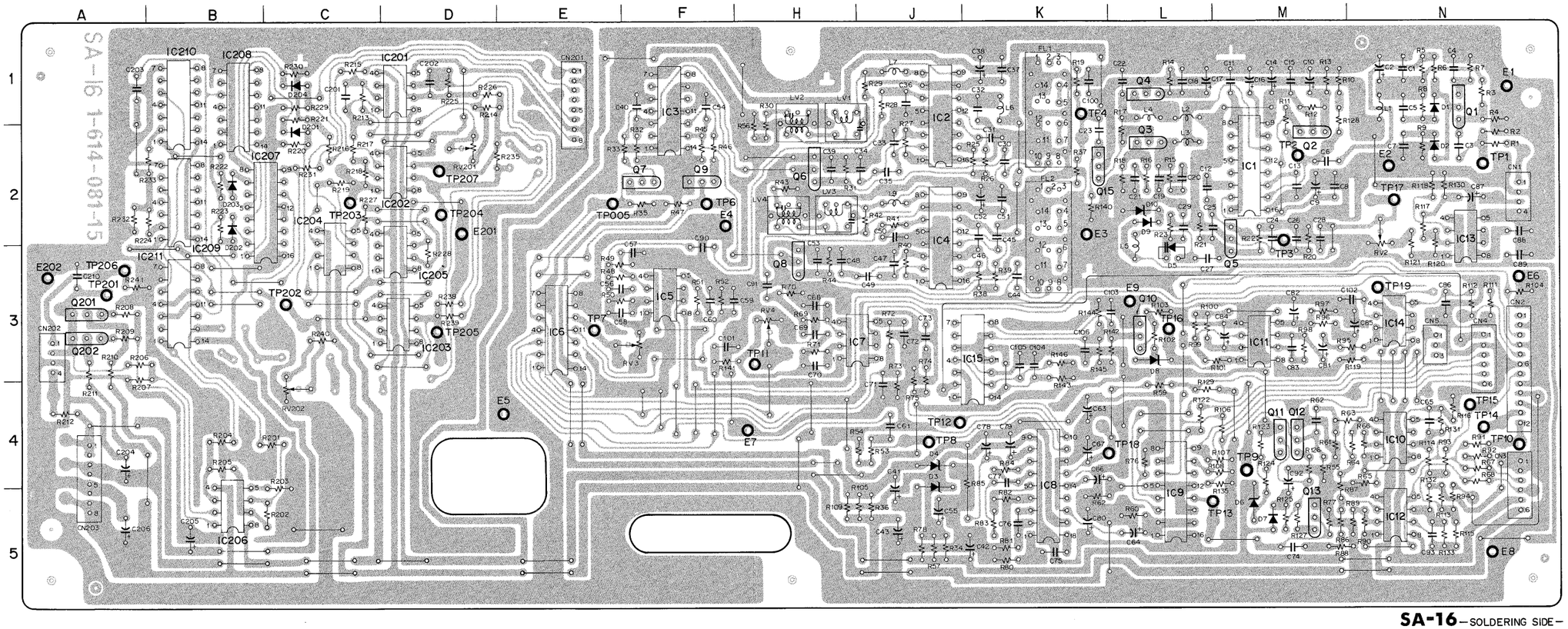


㉑ CN1-1



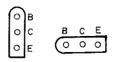
SA-16

SA-16 (AUDIO SYSTEM)



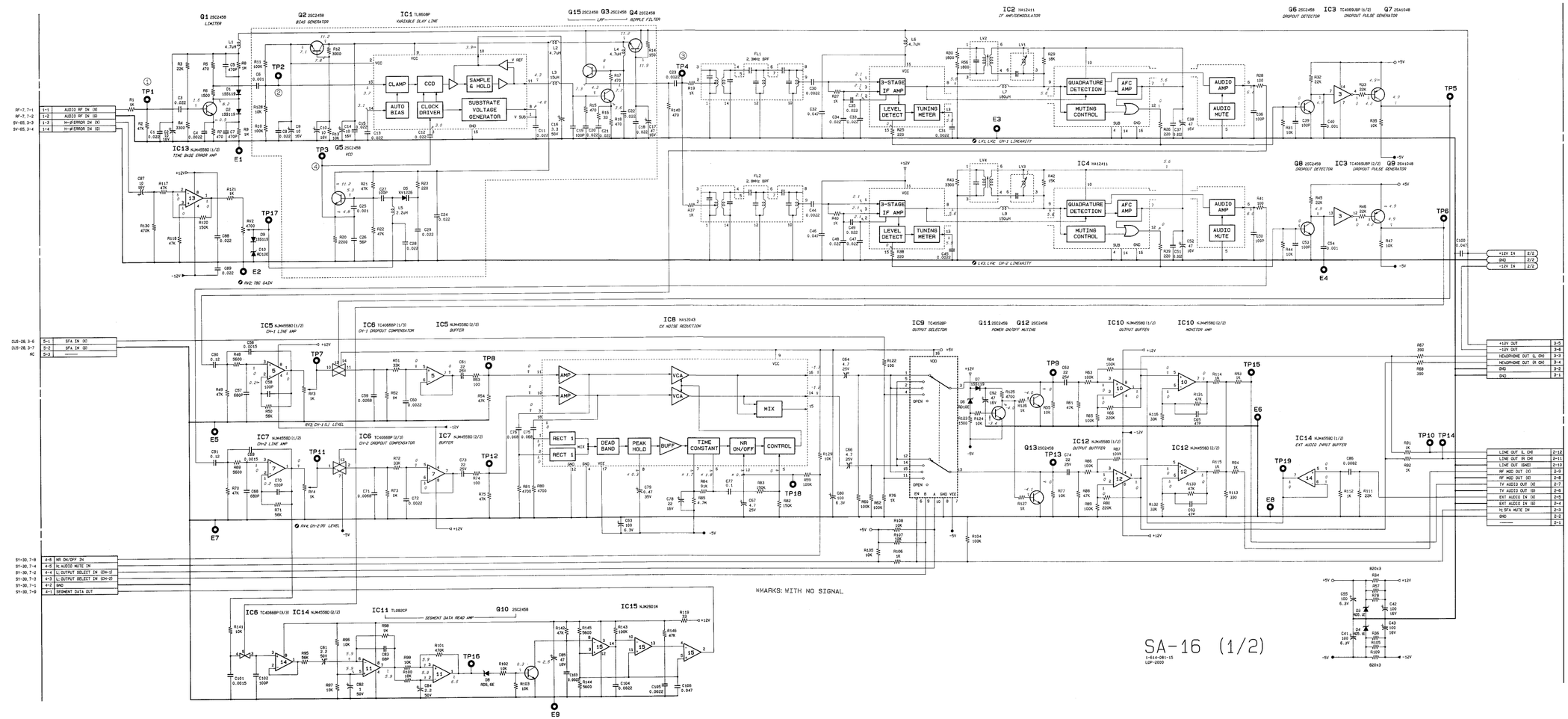
SA-16 — SOLDERING SIDE —

1 - 614 - 081 - 15
LDP - 2000

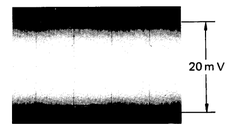


CN1	N · 2	E1	N · 1	IC10	L · 4	Q1	N · 1	TP1	N · 1	TP205	D · 3
CN2	N · 3	E2	N · 2	IC11	M · 3	Q2	M · 2	TP2	M · 2	TP206	A · 3
CN3	N · 4	E3	K · 2	IC12	N · 5	Q3	L · 2	TP3	M · 2	TP207	D · 2
CN4	N · 3	E4	F · 2	IC13	N · 2	Q4	L · 1	TP4	K · 1		
CN5	N · 3	E5	E · 4	IC14	N · 3	Q5	M · 2	TP5	E · 2		
CN201	E · 1	E6	N · 3	IC201	D · 1	Q6	H · 2	TP6	F · 2		
CN202	A · 3	E7	H · 4	IC202	D · 2	Q7	F · 2	TP7	E · 3		
CN203	A · 4	E8	N · 5	IC203	D · 3	Q8	H · 3	TP8	J · 4		
		E9	L · 3	IC204	C · 3	Q9	F · 2	TP9	M · 4		
D1	N · 1	E201	D · 2	IC205	D · 3	Q10	L · 3	TP10	N · 4		
D2	N · 2	E202	A · 3	IC206	B · 5	Q11	M · 4	TP11	H · 3		
D3	J · 4			IC207	C · 2	Q12	M · 4	TP12	J · 4		
D4	J · 4	FL1	K · 1	IC208	B · 1	Q13	M · 5	TP13	L · 5		
D5	L · 3	FL2	K · 2	IC209	B · 2	Q15	K · 2	TP14	N · 4		
D6	M · 5			IC210	B · 1	Q201	A · 3	TP15	N · 4		
D7	M · 5	IC1	M · 2	IC211	B · 2	Q202	A · 3	TP16	L · 3		
D8	L · 8	IC2	J · 2					TP17	N · 2		
D9	L · 2	IC3	F · 1	LV1	H · 1	RV2	N · 2	TP18	L · 4		
D10	L · 2	IC4	J · 3	LV2	H · 1	RV3	F · 3	TP19	N · 3		
D201	C · 2	IC5	F · 3	LV3	H · 2	RV4	H · 3	TP201	A · 3		
D202	B · 2	IC6	E · 3	LV4	H · 2	RV201	D · 2	TP202	C · 3		
D203	B · 2	IC7	H · 3			RV202	C · 4	TP203	C · 2		
D204	C · 2	IC8	K · 4					TP204	D · 2		
		IC9	L · 5								

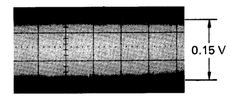
SA-16 (AUDIO SYSTEM)


Q1 2SC2458 LIMITER
Q2 2SC2458 BIAS GENERATOR
IC1 TL866P VARIABLE DLAY LINE
Q15 2SC2458 Q3 2SC2458 Q4 2SC2458 LPF RIPPLE FILTER
IC2 HA12411 IF AMP/DEMODULATOR
Q6 2SC2458 DROPOUT DETECTOR
IC3 TC4069UBP (1/2) DROPOUT PULSE GENERATOR
Q7 2SA1048
IC13 NJM4558D (1/2) TIME BASE ERROR AMP
Q5 2SC2458 VCO
IC4 HA12411
Q8 2SC2458 DROPOUT DETECTOR
IC3 TC4069UBP (2/2) DROPOUT PULSE GENERATOR
Q9 2SA1048
IC5 NJM4558D (1/2) CH-1 LINE AMP
IC6 TC4066BP (1/3) CH-1 DROPOUT COMPENSATOR
IC5 NJM4558D (2/2) BUFFER
IC8 HA12043 CX NOISE REDUCTION
IC9 TC4052BP OUTPUT SELECTOR
Q11 2SC2458 Q12 2SC2458 POWER ON/OFF MUTING
IC10 NJM4558D (1/2) OUTPUT BUFFER
IC10 NJM4558D (2/2) MONITOR AMP
IC7 NJM4558D (1/2) CH-2 LINE AMP
IC6 TC4066BP (2/3) CH-2 DROPOUT COMPENSATOR
IC7 NJM4558D (2/2) BUFFER
IC12 NJM4558D (1/2) OUTPUT BUFFER
Q13 2SC2458
IC14 NJM4558D (1/2) EXT AUDIO INPUT BUFFER
IC6 TC4066BP (3/3)
IC14 NJM4558D (2/2)
IC11 TL082CP SEGMENT DATA READ AMP
Q10 2SC2458
IC15 NJM2903M
MIX
RECT 1
RECT 2
DEAD BAND
PEAK HOLD
BUFF
TIME CONSTANT
NR ON/OFF
CONTROL
CLAMP
CCD
SAMPLE & HOLD
AUTO BIAS
CLOCK DRIVER
SUBSTRATE VOLTAGE GENERATOR
3-STAGE IF AMP
LEVEL DETECT
TUNING METER
QUADRATURE DETECTION
MUTING CONTROL
AFC AMP
AUDIO AMP
AUDIO MUTE
RF-7, 7-1 1-1 AUDIO RF IN (X)
RF-7, 7-2 1-2 AUDIO RF IN (S)
SV-65, 3-3 1-3 H-φ ERROR IN (X)
SV-65, 3-4 1-4 H-φ ERROR IN (S)
DUS-28, 3-6 5-1 SFA IN (X)
DUS-28, 3-7 5-2 SFA IN (S)
NC 5-3
SY-30, 7-8 4-8 NR ON/OFF IN
SY-30, 7-4 4-6 H. AUDIO MUTE IN
SY-30, 7-2 4-4 L. OUTPUT SELECT IN (CH-1)
SY-30, 7-3 4-3 L. OUTPUT SELECT IN (CH-2)
SY-30, 7-1 4-2 GND
SY-30, 7-9 4-1 SEGMENT DATA OUT
+12V OUT 3-5 HP-18, 1-5
-12V OUT 3-6 HP-18, 1-6
HEADPHONE OUT (L CH) 3-3 HP-18, 1-3
HEADPHONE OUT (R CH) 3-4 HP-18, 1-4
GND 3-2 HP-18, 1-2
GND 3-1 HP-18, 1-1
LINE OUT (L CH) 2-12 DU-84, 1-3
LINE OUT (R CH) 2-11 DU-84, 1-5
LINE OUT (GND) 2-10 DU-84, 1-4
RF MOD OUT (X) 2-9 RF-MOD, 1-2
RF MOD OUT (S) 2-8 RF-MOD, 1-1
TV AUDIO OUT (X) 2-7 DU-84, 1-1
TV AUDIO OUT (S) 2-6 DU-84, 1-2
EXT AUDIO IN (X) 2-5 DUS-28, 1-2
EXT AUDIO IN (S) 2-4 DUS-28, 1-3
H. SFA MUTE IN 2-3 DUS-28, 3-9
GND 2-2 NC
2-1 NC
+12V IN 2/2
GND 2/2
-12V IN 2/2
E1 E2 E3 E4 E5 E6 E7 E8 E9
TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP9 TP10 TP11 TP12 TP13 TP14 TP15 TP16 TP17 TP18 TP19
NMARKS: WITH NO SIGNAL
SA-16 (1/2)
1-514-081-15
LGP-2000

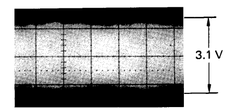
① TP1



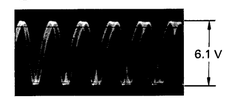
② TP2



③ TP4



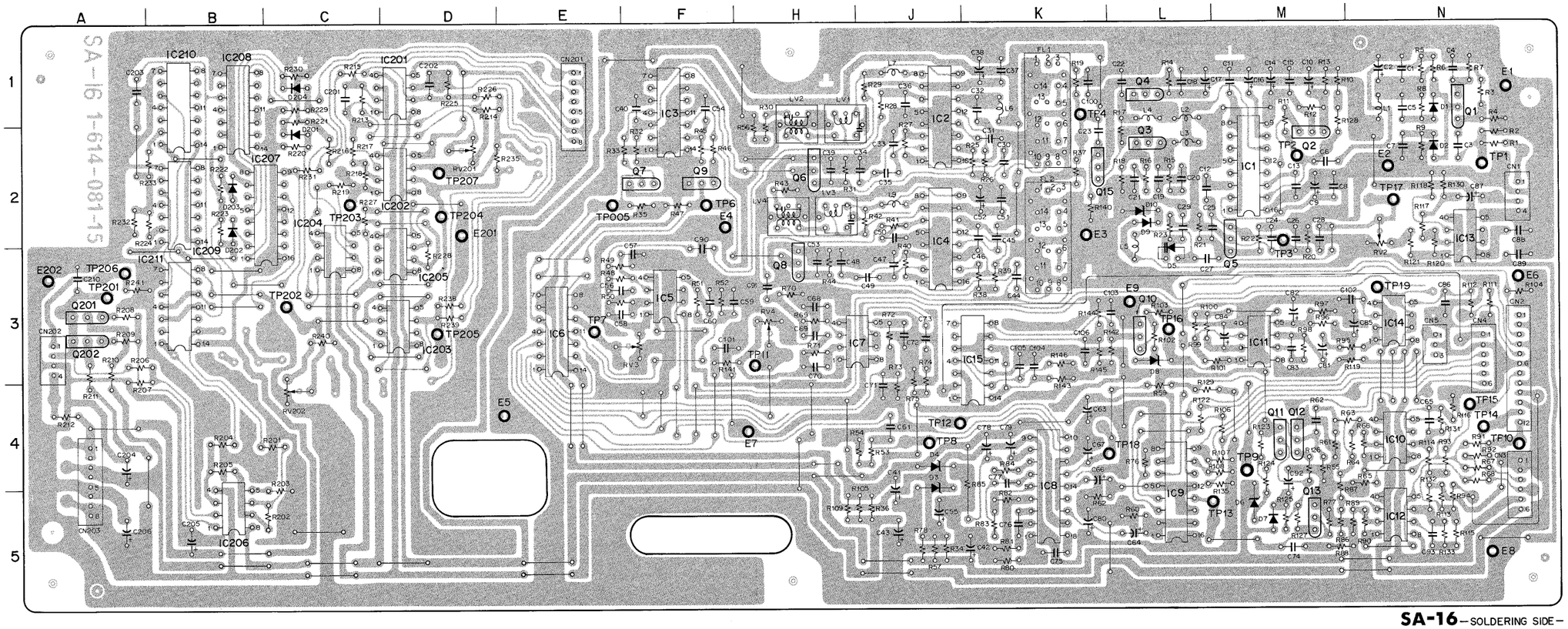
④ TP3



9 MHz (T=110 nS)

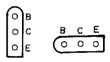
SA-16

SA-16 (SKEW SERVO)



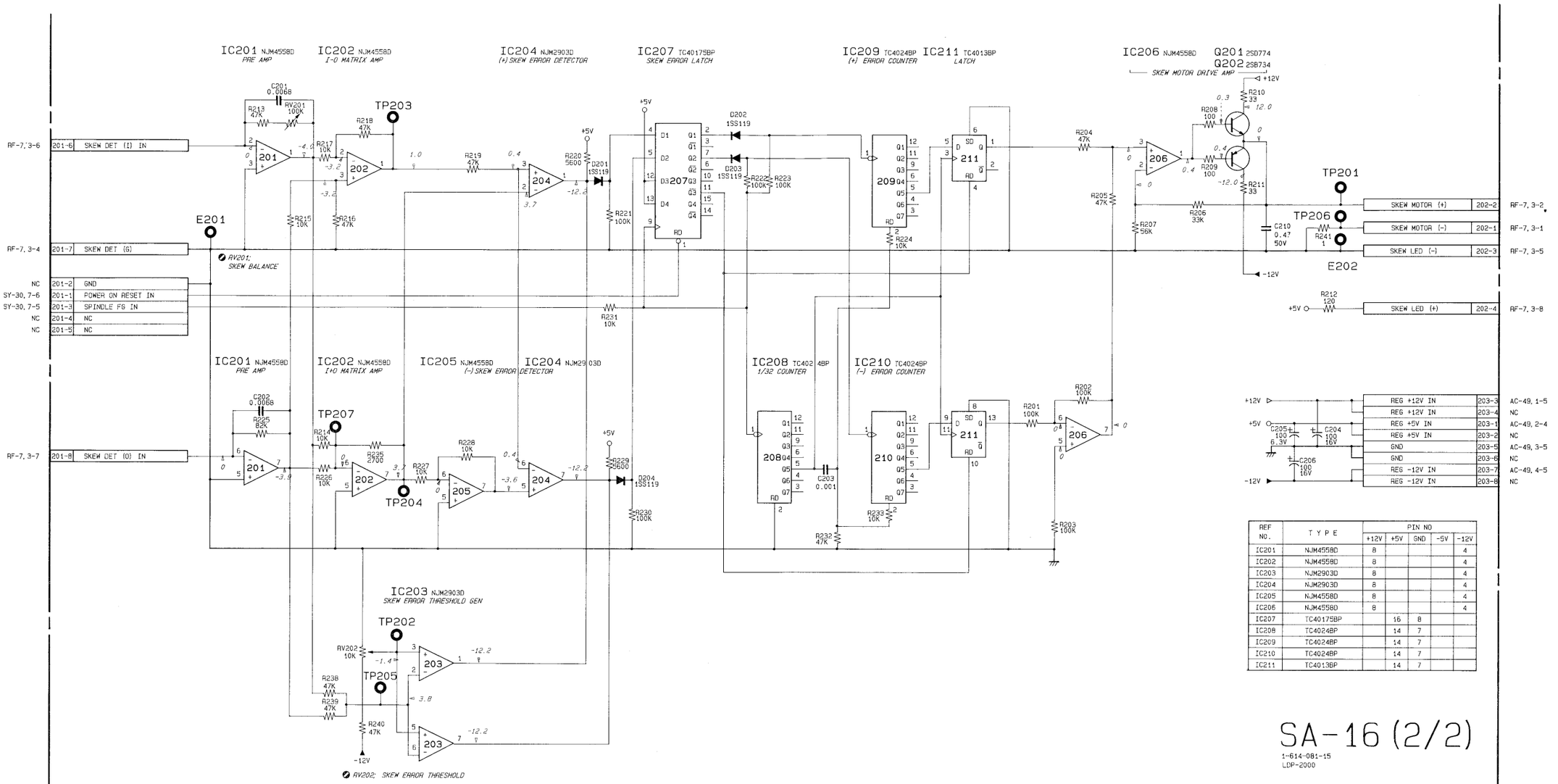
SA-16 — SOLDERING SIDE —

1 - 614 - 081 - 15
LDP - 2000



CN1	N - 2	E1	N - 1	IC10	L - 4	Q1	N - 1	TP1	N - 1	TP205	D - 3
CN2	N - 3	E2	N - 2	IC11	M - 3	Q2	M - 2	TP2	M - 2	TP206	A - 3
CN3	N - 4	E3	K - 2	IC12	N - 5	Q3	L - 2	TP3	M - 2	TP207	D - 2
CN4	N - 3	E4	F - 2	IC13	N - 2	Q4	L - 1	TP4	K - 1		
CN5	N - 3	E5	E - 4	IC14	N - 3	Q5	M - 2	TP5	E - 2		
CN201	E - 1	E6	N - 3	IC201	D - 1	Q6	H - 2	TP6	F - 2		
CN202	A - 3	E7	H - 4	IC202	D - 2	Q7	F - 2	TP7	E - 3		
CN203	A - 4	E8	N - 5	IC203	D - 3	Q8	H - 3	TP8	J - 4		
		E9	L - 3	IC204	C - 3	Q9	F - 2	TP9	M - 4		
D1	N - 1	E201	D - 2	IC205	D - 3	Q10	L - 3	TP10	N - 4		
D2	N - 2	E202	A - 3	IC206	B - 5	Q11	M - 4	TP11	H - 3		
D3	J - 4			IC207	C - 2	Q12	M - 4	TP12	J - 4		
D4	J - 4	FL1	K - 1	IC208	B - 1	Q13	M - 5	TP13	L - 5		
D5	L - 3	FL2	K - 2	IC209	B - 2	Q15	K - 2	TP14	N - 4		
D6	M - 5			IC210	B - 1	Q201	A - 3	TP15	N - 4		
D7	M - 5	IC1	M - 2	IC211	B - 2	Q202	A - 3	TP16	L - 3		
D8	L - 8	IC2	J - 2					TP17	N - 2		
D9	L - 2	IC3	F - 1	LV1	H - 1	RV2	N - 2	TP18	L - 4		
D10	L - 2	IC4	J - 3	LV2	H - 1	RV3	F - 3	TP19	N - 3		
D201	C - 2	IC5	F - 3	LV3	H - 2	RV4	H - 3	TP201	A - 3		
D202	B - 2	IC6	E - 3	LV4	H - 2	RV201	D - 2	TP202	C - 3		
D203	B - 2	IC7	H - 3			RV202	C - 4	TP203	C - 2		
D204	C - 2	IC8	K - 4					TP204	D - 2		
		IC9	L - 5								

SA-16 (SKEW SERVO)


IC201 NJM4558D PRE AMP
IC202 NJM4558D I-O MATRIX AMP
IC204 NJM2903D (+) SKEW ERROR DETECTOR
IC207 TC40175BP SKEW ERROR LATCH
IC209 TC4024BP (+) ERROR COUNTER
IC211 TC4013BP LATCH
IC206 NJM4558D
Q201 2SD774
Q202 2SB734
SKEW MOTOR DRIVE AMP
IC205 NJM4558D (-) SKEW ERROR DETECTOR
IC208 TC4024BP 1/32 COUNTER
IC210 TC4024BP (-) ERROR COUNTER
IC203 NJM2903D SKEW ERROR THRESHOLD GEN
RF-7, 3-6 201-6 SKEW DET (I) IN
RF-7, 3-7 201-8 SKEW DET (O) IN
RF-7, 3-4 201-7 SKEW DET (G)
NC 201-2 GND
SY-30, 7-6 201-1 POWER ON RESET IN
SY-30, 7-5 201-3 SPINDLE FG IN
NC 201-4 NC
NC 201-5 NC
E201
RV201: SKEW BALANCE
RV202: SKEW ERROR THRESHOLD
TP201
TP202
TP203
TP204
TP205
TP206
TP207
E202
SKEW MOTOR (+) 202-2 RF-7, 3-2
SKEW MOTOR (-) 202-1 RF-7, 3-1
SKEW LED (-) 202-3 RF-7, 3-5
SKEW LED (+) 202-4 RF-7, 3-8
REG +12V IN 203-3 AC-49, 1-5
REG +12V IN 203-4 NC
REG +5V IN 203-1 AC-49, 2-4
REG +5V IN 203-2 NC
GND 203-5 AC-49, 3-5
GND 203-6 NC
REG -12V IN 203-7 AC-49, 4-5
REG -12V IN 203-8 NC

REF NO.	TYPE	PIN NO				
		+12V	+5V	GND	-5V	-12V
IC201	NJM4558D	8				4
IC202	NJM4558D	8				4
IC203	NJM2903D	8				4
IC204	NJM2903D	8				4
IC205	NJM4558D	8				4
IC206	NJM4558D	8				4
IC207	TC40175BP		16	8		
IC208	TC4024BP		14	7		
IC209	TC4024BP		14	7		
IC210	TC4024BP		14	7		
IC211	TC4013BP		14	7		

SA-16 (2/2)

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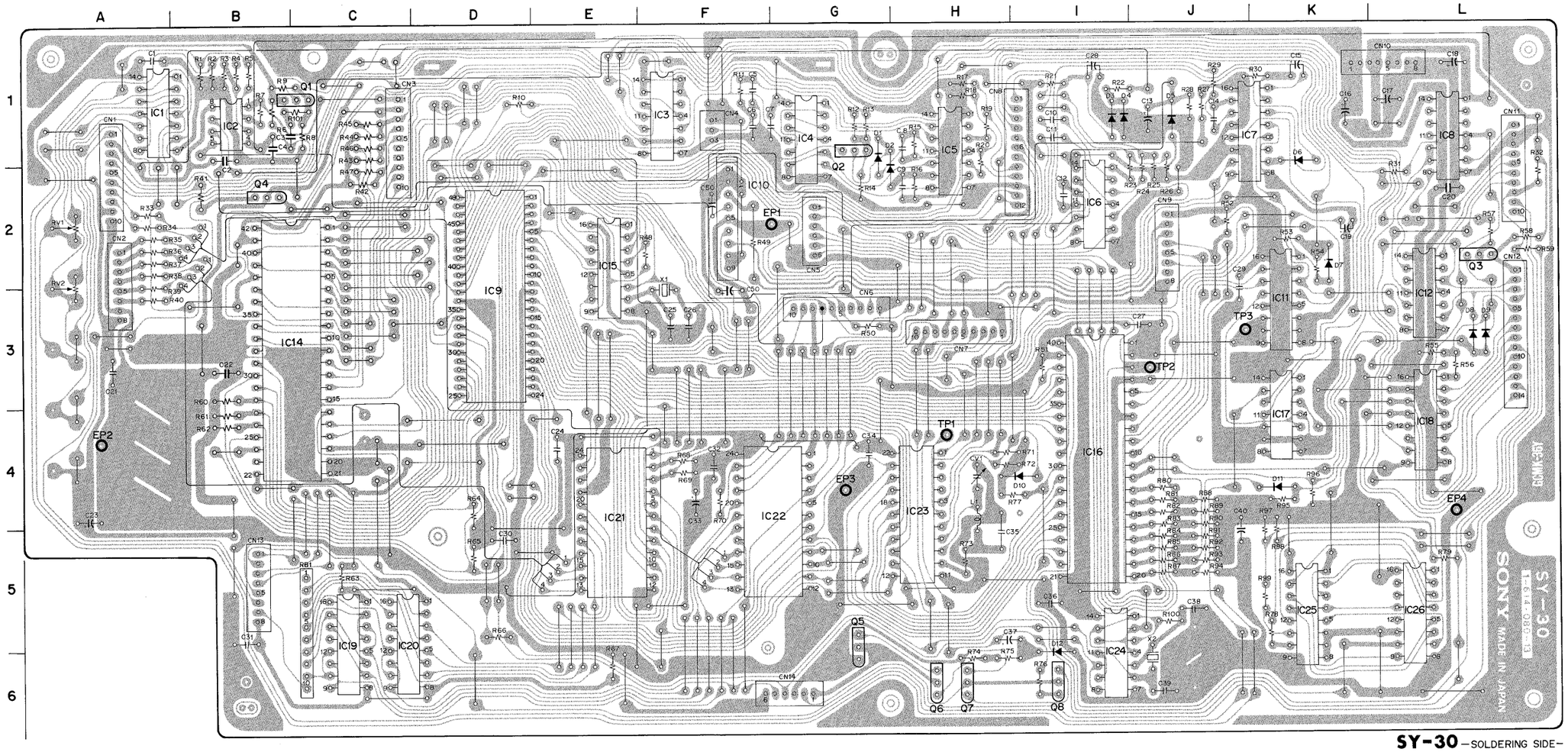
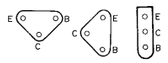
LDP-2000

SY-30 (SYSTEM CONTROL)



CN1	A・1	IC1	A・1
CN2	A・2	IC2	B・1
CN3	C・1	IC3	F・1
CN4	F・1	IC4	G・1
CN5	G・2	IC5	H・1
CN6	G・3	IC6	I・2
CN7	H・3	IC7	J・1
CN8	I・1	IC8	L・1
CN9	J・2	IC9	D・2
CN10	L・1	IC10	F・2
CN11	L・1	IC11	K・3
CN12	L・3	IC12	L・3
CN13	B・5	IC14	C・3
CN14	G・6	IC15	E・2
		IC16	I・4
CV1	H・4	IC17	K・4
		IC18	L・4
D1	G・2	IC19	C・5
D2	G・2	IC20	C・5
D3	I・1	IC21	E・4
D4	I・1	IC22	F・4
D5	J・1	IC23	H・4
D6	K・2	IC24	I・5
D7	K・2	IC25	K・5
D8	L・3	IC26	L・5
D9	L・3		
D10	I・4	Q1	C・1
D11	K・4	Q2	G・1
D12	I・6	Q3	L・2
		Q4	B・2
EP1	G・2	Q5	G・5
EP2	A・4	Q6	H・6
EP3	G・4	Q7	H・6
EP4	L・4	Q8	I・6
		RV1	A・2
		RV2	A・2
		TP1	H・4
		TP2	J・3
		TP3	J・3
		X1	F・3
		X2	J・6

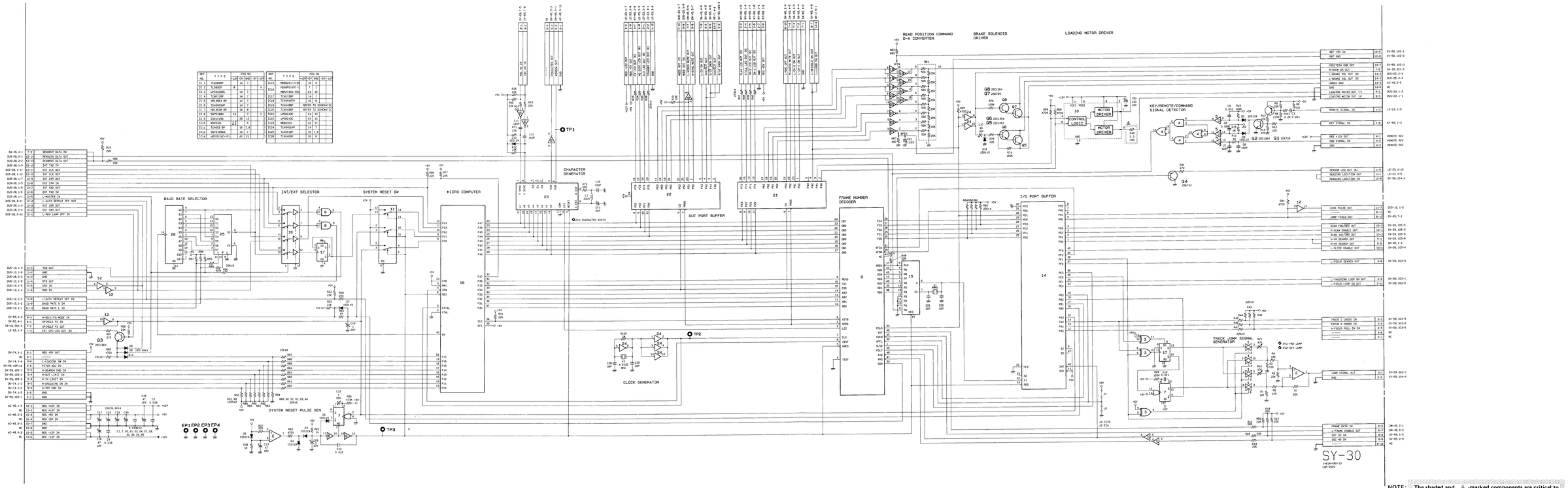


SY-30 —SOLDERING SIDE—

1-614-080-13
LDP-2000

SY-30 SY-30

SY-30 (SYSTEM CONTROL)



NOTE: The shaded and ⚠ -marked components are critical to safety.
Replace only with same components as specified.

ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS
- All resistors are in ohms
- F : nonflammable

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

CAPACITORS
- MF : μF, PF : μμF

COILS
- MMH : mH, UH : μH

Ref.No	Part No.	Description			Remark
	*A-6421-038-B	SA-16 BOARD, COMPLETE **********			
	*3-688-333-02	SHIELD (REAR), SA			
	*3-688-332-02	SHIELD (FRONT), SA			
		CAPACITOR			
C1	1-161-055-00	CERAMIC	0.022MF	10%	25V
C2	1-123-356-00	ELECT	10MF	20%	16V
C3	1-161-055-00	CERAMIC	0.022MF	10%	25V
C4	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C5	1-102-114-00	CERAMIC	470PF	10%	50V
C6	1-102-074-00	CERAMIC	0.001MF	10%	50V
C7	1-102-114-00	CERAMIC	470PF	10%	50V
C8	1-161-055-00	CERAMIC	0.022MF	10%	25V
C9	1-123-356-00	ELECT	10MF	20%	16V
C10	1-123-356-00	ELECT	10MF	20%	16V
C11	1-161-055-00	CERAMIC	0.022MF	10%	25V
C12	1-161-055-00	CERAMIC	0.022MF	10%	25V
C13	1-161-055-00	CERAMIC	0.022MF	10%	25V
C14	1-123-356-00	ELECT	10MF	20%	16V
C15	1-161-055-00	CERAMIC	0.022MF	10%	25V
C16	1-123-382-00	ELECT	3.3MF	20%	50V
C17	1-123-332-00	ELECT	47MF	20%	16V
C18	1-161-055-00	CERAMIC	0.022MF	10%	25V
C19	1-102-106-00	CERAMIC	100PF	10%	50V
C20	1-161-055-00	CERAMIC	0.022MF	10%	25V
C21	1-161-055-00	CERAMIC	0.022MF	10%	25V
C22	1-161-055-00	CERAMIC	0.022MF	10%	25V
C23	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C24	1-161-055-00	CERAMIC	0.022MF	10%	25V
C25	1-102-074-00	CERAMIC	0.001MF	10%	50V
C26	1-107-079-00	MICA	56PF	5%	50V
C27	1-107-085-00	MICA	100PF	5%	50V
C28	1-161-055-00	CERAMIC	0.022MF	10%	25V
C29	1-161-055-00	CERAMIC	0.022MF	10%	25V
C30	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C31	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C32	1-161-059-00	CERAMIC	0.047MF	10%	25V
C33	1-161-055-00	CERAMIC	0.022MF	10%	25V
C34	1-161-055-00	CERAMIC	0.022MF	10%	25V
C35	1-161-055-00	CERAMIC	0.022MF	10%	25V
C36	1-102-106-00	CERAMIC	100PF	10%	50V
C37	1-161-055-00	CERAMIC	0.022MF	10%	25V
C38	1-123-332-00	ELECT	47MF	20%	16V
C39	1-102-106-00	CERAMIC	100PF	10%	50V
C40	1-130-471-00	MYLAR	0.001MF	5%	50V
C41	1-123-307-00	ELECT	100MF	20%	6.3V
C42	1-123-333-00	ELECT	100MF	20%	16V
C43	1-123-333-00	ELECT	100MF	20%	16V
C44	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C45	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C46	1-161-059-00	CERAMIC	0.047MF	10%	25V
C47	1-161-055-00	CERAMIC	0.022MF	10%	25V
C48	1-161-055-00	CERAMIC	0.022MF	10%	25V
C49	1-161-055-00	CERAMIC	0.022MF	10%	25V
C50	1-102-106-00	CERAMIC	100PF	10%	50V
C51	1-161-055-00	CERAMIC	0.022MF	10%	25V
C52	1-123-332-00	ELECT	47MF	20%	16V
C53	1-102-106-00	CERAMIC	100PF	10%	50V
C54	1-130-471-00	MYLAR	0.001MF	5%	50V
C55	1-123-307-00	ELECT	100MF	20%	6.3V
C56	1-130-473-00	MYLAR	0.0015MF	5%	50V
C57	1-102-116-00	CERAMIC	680PF	10%	50V
C58	1-102-106-00	CERAMIC	100PF	10%	50V
C59	1-130-481-00	MYLAR	0.0068MF	5%	50V
C60	1-130-475-00	MYLAR	0.0022MF	5%	50V
C61	1-124-007-11	ELECT	22MF	20%	25V
C62	1-124-007-11	ELECT	22MF	20%	25V
C63	1-123-307-00	ELECT	100MF	20%	6.3V
C64	1-123-369-00	ELECT	4.7MF	20%	25V
C65	1-107-077-00	MICA	47PF	5%	50V
C66	1-123-369-00	ELECT	4.7MF	20%	25V
C67	1-123-369-00	ELECT	4.7MF	20%	25V
C68	1-102-116-00	CERAMIC	680PF	10%	50V
C69	1-130-473-00	MYLAR	0.0015MF	5%	50V
C70	1-102-106-00	CERAMIC	100PF	10%	50V
C71	1-130-481-00	MYLAR	0.0068MF	5%	50V
C72	1-130-475-00	MYLAR	0.0022MF	5%	50V
C73	1-124-007-11	ELECT	22MF	20%	25V
C74	1-124-007-11	ELECT	22MF	20%	25V
C75	1-130-493-00	MYLAR	0.068MF	5%	50V
C76	1-130-493-00	MYLAR	0.068MF	5%	50V
C77	1-130-493-00	MYLAR	0.1MF	5%	50V
C78	1-131-373-00	TANTALUM	22MF	10%	16V
C79	1-131-345-00	TANTALUM	0.47MF	10%	35V
C80	1-123-307-00	ELECT	100MF	20%	6.3V
C81	1-123-381-00	ELECT	2.2MF	20%	50V
C82	1-123-380-00	ELECT	1MF	20%	50V
C83	1-107-081-00	MICA	68PF	5%	50V
C84	1-123-381-00	ELECT	2.2MF	20%	50V
C85	1-123-332-00	ELECT	47MF	20%	16V
C86	1-130-482-00	MYLAR	0.0082MF	5%	50V
C87	1-123-356-00	ELECT	10MF	20%	16V
C88	1-161-055-00	CERAMIC	0.022MF	10%	25V
C89	1-161-055-00	CERAMIC	0.022MF	10%	25V
C90	1-136-166-00	MYLAR	0.12MF	5%	50V
C91	1-136-166-00	MYLAR	0.12MF	5%	50V
C92	1-123-332-00	ELECT	47MF	20%	16V
C93	1-107-077-00	MICA	47PF	5%	50V
C100	1-161-059-00	CERAMIC	0.047MF	10%	25V
C101	1-130-473-00	MYLAR	0.0015MF	5%	50V
C102	1-107-085-00	MICA	100PF	5%	50V
C103	1-130-475-00	MYLAR	0.0022MF	5%	50V

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Ref.No	Part No.	Description				Remark
C104	1-130-475-00	MYLAR	0.0022MF	5%	50V	
C105	1-130-475-00	MYLAR	0.0022MF	5%	50V	
C106	1-161-059-00	CERAMIC	0.047MF	10%	25V	
C201	1-130-481-00	MYLAR	0.0068MF	5%	50V	
C202	1-130-481-00	MYLAR	0.0068MF	5%	50V	
C203	1-130-471-00	MYLAR	0.001MF	5%	50V	
C204	1-123-333-00	ELECT	100MF	20%	16V	
C205	1-123-307-00	ELECT	100MF	20%	6.3V	
C206	1-123-333-00	ELECT	100MF	20%	16V	
C210	1-124-270-11	ELECT	0.47MF	20%	50V	
		CONNECTOR				
CN1	*1-564-003-00	PIN, CONNECTOR 4P				
CN2	*1-564-011-11	PIN, CONNECTOR 12P				
CN3	*1-564-005-00	PIN, CONNECTOR 6P				
CN4	*1-564-005-00	PIN, CONNECTOR 6P				
CN5	1-564-002-00	PIN, CONNECTOR 3P				
CN201	*1-564-007-00	PIN, CONNECTOR 8P				
CN202	*1-564-003-00	PIN, CONNECTOR 4P				
CN203	*1-564-007-00	PIN, CONNECTOR 8P				
		DIODE				
D1	8-719-911-19	DIODE 1SS119				
D2	8-719-911-19	DIODE 1SS119				
D3	8-719-151-07	DIODE RD5.1E-B				
D4	8-719-151-07	DIODE RD5.1E-B				
D5	8-719-912-27	DIODE KV1226				
D6	8-719-110-07	DIODE RD10E-B				
D7	8-719-911-19	DIODE 1SS119				
D8	8-719-156-07	DIODE RD5.6E-B				
D9	8-719-911-19	DIODE 1SS119				
D10	8-719-110-07	DIODE RD10E-B				
D201	8-719-911-19	DIODE 1SS119				
D202	8-719-911-19	DIODE 1SS119				
D203	8-719-911-19	DIODE 1SS119				
D204	8-719-911-19	DIODE 1SS119				
		FILTER				
FL1	1-235-591-11	FILTER, BAND PASS				
FL2	1-235-824-11	FILTER, BAND PASS				
		IC				
IC1	8-759-201-69	IC TL8608P				
IC2	8-759-324-11	IC HA12411				
IC3	8-759-240-69	IC TC4069UBP				
IC4	8-759-324-11	IC HA12411				
IC5	8-759-705-58	IC NJM4558D-D				
IC6	8-759-240-66	IC TC4066BP				
IC7	8-759-705-58	IC NJM4558D-D				
IC8	8-759-302-81	IC HA12043				
IC9	8-759-240-52	IC TC4052BP				
IC10	8-759-705-58	IC NJM4558D-D				
IC11	8-759-990-82	IC TL082CP				

Ref.No	Part No.	Description				Remark
IC12	8-759-705-58	IC NJM4558D-D				
IC13	8-759-705-58	IC NJM4558D-D				
IC14	8-759-705-58	IC NJM4558D-D				
IC15	8-759-729-01	IC NJM2901N				
IC201	8-759-705-58	IC NJM4558D-D				
IC202	8-759-705-58	IC NJM4558D-D				
IC203	8-759-729-03	IC NJM2903D				
IC204	8-759-729-03	IC NJM2903D				
IC205	8-759-705-58	IC NJM4558D-D				
IC206	8-759-705-58	IC NJM4558D-D				
IC207	8-759-241-75	IC TC40175BP				
IC208	8-759-240-24	IC TC4024BP				
IC209	8-759-240-24	IC TC4024BP				
IC210	8-759-240-24	IC TC4024BP				
IC211	8-759-240-13	IC TC4013BP				
		COIL				
L1	1-408-405-00	MICRO INDUCTOR 4.7UH				
L2	1-408-405-00	MICRO INDUCTOR 4.7UH				
L3	1-408-411-00	MICRO INDUCTOR 15UH				
L4	1-408-405-00	MICRO INDUCTOR 4.7UH				
L5	1-408-401-00	MICRO INDUCTOR 2.2UH				
L6	1-408-405-00	MICRO INDUCTOR 4.7UH				
L7	1-408-424-00	MICRO INDUCTOR 180UH				
L9	1-408-423-00	MICRO INDUCTOR 150UH				
		VARIABLE COIL				
LV1	1-404-597-11	COIL, DETECTOR				
LV2	1-404-598-11	COIL, DETECTOR				
LV3	1-404-599-11	COIL, DETECTOR				
LV4	1-404-600-11	COIL, DETECTOR				
		TRANSISTOR				
Q1	8-729-245-83	TRANSISTOR 2SC2458				
Q2	8-729-245-83	TRANSISTOR 2SC2458				
Q3	8-729-245-83	TRANSISTOR 2SC2458				
Q4	8-729-245-83	TRANSISTOR 2SC2458				
Q5	8-729-245-83	TRANSISTOR 2SC2458				
Q6	8-729-245-83	TRANSISTOR 2SC2458				
Q7	8-729-204-83	TRANSISTOR 2SA1048-GR				
Q8	8-729-245-83	TRANSISTOR 2SC2458				
Q9	8-729-204-83	TRANSISTOR 2SA1048-GR				
Q10	8-729-245-83	TRANSISTOR 2SC2458				
Q11	8-729-245-83	TRANSISTOR 2SC2458				
Q12	8-729-245-83	TRANSISTOR 2SC2458				
Q13	8-729-245-83	TRANSISTOR 2SC2458				
Q15	8-729-245-83	TRANSISTOR 2SC2458				
Q201	8-729-177-43	TRANSISTOR 2SD774				
Q202	8-729-103-43	TRANSISTOR 2SB734				
		RESISTOR				
R1	1-249-417-11	CARBON	1K	5%	1/6W	
R2	1-249-437-11	CARBON	47K	5%	1/6W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R3	1-249-433-11	CARBON	22K	5%	1/6W	
R4	1-249-423-11	CARBON	3.3K	5%	1/6W	
R5	1-247-823-00	CARBON	470	5%	1/6W	
R6	1-249-419-11	CARBON	1.5K	5%	1/6W	
R7	1-247-823-00	CARBON	470	5%	1/6W	
R8	1-247-903-00	CARBON	1M	5%	1/6W	
R9	1-247-903-00	CARBON	1M	5%	1/6W	
R10	1-249-441-11	CARBON	100K	5%	1/6W	
R11	1-249-441-11	CARBON	100K	5%	1/6W	
R12	1-247-845-00	CARBON	3.9K	5%	1/6W	
R13	1-249-429-11	CARBON	10K	5%	1/6W	
R14	1-247-811-00	CARBON	150	5%	1/6W	
R15	1-247-823-00	CARBON	470	5%	1/6W	
R16	1-247-795-00	CARBON	33	5%	1/6W	
R17	1-247-823-00	CARBON	470	5%	1/6W	
R18	1-247-823-00	CARBON	470	5%	1/6W	
R19	1-249-417-11	CARBON	1K	5%	1/6W	
R20	1-247-839-00	CARBON	2.2K	5%	1/6W	
R21	1-249-437-11	CARBON	47K	5%	1/6W	
R22	1-249-437-11	CARBON	47K	5%	1/6W	
R23	1-247-815-00	CARBON	220	5%	1/6W	
R25	1-247-815-00	CARBON	220	5%	1/6W	
R26	1-247-815-00	CARBON	220	5%	1/6W	
R27	1-249-417-11	CARBON	1K	5%	1/6W	
R28	1-249-405-11	CARBON	100	5%	1/6W	
R29	1-249-432-11	CARBON	18K	5%	1/6W	
R30	1-249-420-11	CARBON	1.8K	5%	1/6W	
R31	1-249-429-11	CARBON	10K	5%	1/6W	
R32	1-249-433-11	CARBON	22K	5%	1/6W	
R33	1-249-433-11	CARBON	22K	5%	1/6W	
R34	1-247-829-00	CARBON	820	5%	1/6W	
R35	1-249-429-11	CARBON	10K	5%	1/6W	
R36	1-247-829-00	CARBON	820	5%	1/6W	
R37	1-249-417-11	CARBON	1K	5%	1/6W	
R38	1-247-815-00	CARBON	220	5%	1/6W	
R39	1-247-815-00	CARBON	220	5%	1/6W	
R40	1-249-417-11	CARBON	1K	5%	1/6W	
R41	1-249-405-11	CARBON	100	5%	1/6W	
R42	1-247-859-00	CARBON	15K	5%	1/6W	
R43	1-249-423-11	CARBON	3.3K	5%	1/6W	
R44	1-249-429-11	CARBON	10K	5%	1/6W	
R45	1-249-433-11	CARBON	22K	5%	1/6W	
R46	1-249-433-11	CARBON	22K	5%	1/6W	
R47	1-249-429-11	CARBON	10K	5%	1/6W	
R48	1-247-849-00	CARBON	5.6K	5%	1/6W	
R49	1-249-437-11	CARBON	47K	5%	1/6W	
R50	1-247-873-00	CARBON	56K	5%	1/6W	
R51	1-249-435-11	CARBON	33K	5%	1/6W	
R52	1-247-903-00	CARBON	1M	5%	1/6W	
R53	1-249-405-11	CARBON	100	5%	1/6W	
R54	1-249-437-11	CARBON	47K	5%	1/6W	
R55	1-249-429-11	CARBON	10K	5%	1/6W	
R56	1-249-420-11	CARBON	1.8K	5%	1/6W	

Ref.No	Part No.	Description				Remark
R57	1-247-829-00	CARBON	820	5%	1/6W	
R59	1-249-441-11	CARBON	100K	5%	1/6W	
R60	1-249-441-11	CARBON	100K	5%	1/6W	
R61	1-249-437-11	CARBON	47K	5%	1/6W	
R62	1-249-441-11	CARBON	100K	5%	1/6W	
R63	1-249-441-11	CARBON	100K	5%	1/6W	
R64	1-249-441-11	CARBON	100K	5%	1/6W	
R65	1-249-441-11	CARBON	100K	5%	1/6W	
R66	1-247-887-00	CARBON	220K	5%	1/6W	
R67	1-247-821-00	CARBON	390	5%	1/6W	
R68	1-247-821-00	CARBON	390	5%	1/6W	
R69	1-247-849-00	CARBON	5.6K	5%	1/6W	
R70	1-249-437-11	CARBON	47K	5%	1/6W	
R71	1-247-873-00	CARBON	56K	5%	1/6W	
R72	1-249-435-11	CARBON	33K	5%	1/6W	
R73	1-247-903-00	CARBON	1M	5%	1/6W	
R74	1-249-405-11	CARBON	100	5%	1/6W	
R75	1-249-437-11	CARBON	47K	5%	1/6W	
R76	1-249-417-11	CARBON	1K	5%	1/6W	
R77	1-249-429-11	CARBON	10K	5%	1/6W	
R78	1-247-829-00	CARBON	820	5%	1/6W	
R80	1-249-425-11	CARBON	4.7K	5%	1/6W	
R81	1-249-425-11	CARBON	4.7K	5%	1/6W	
R82	1-247-883-00	CARBON	150K	5%	1/6W	
R83	1-247-883-00	CARBON	150K	5%	1/6W	
R84	1-215-468-00	METAL	91K	1%	1/6W	
R85	1-210-828-00	CARBON	4.7M	5%	1/4W	
R86	1-249-441-11	CARBON	100K	5%	1/6W	
R87	1-249-441-11	CARBON	100K	5%	1/6W	
R88	1-249-437-11	CARBON	47K	5%	1/6W	
R89	1-249-441-11	CARBON	100K	5%	1/6W	
R90	1-247-887-00	CARBON	220K	5%	1/6W	
R91	1-249-417-11	CARBON	1K	5%	1/6W	
R92	1-249-417-11	CARBON	1K	5%	1/6W	
R93	1-249-417-11	CARBON	1K	5%	1/6W	
R94	1-249-417-11	CARBON	1K	5%	1/6W	
R95	1-247-873-00	CARBON	56K	5%	1/6W	
R96	1-249-429-11	CARBON	10K	5%	1/6W	
R97	1-249-429-11	CARBON	10K	5%	1/6W	
R98	1-247-903-00	CARBON	1M	5%	1/6W	
R99	1-249-429-11	CARBON	10K	5%	1/6W	
R100	1-249-429-11	CARBON	10K	5%	1/6W	
R101	1-247-895-00	CARBON	470K	5%	1/6W	
R102	1-249-429-11	CARBON	10K	5%	1/6W	
R103	1-249-429-11	CARBON	10K	5%	1/6W	
R104	1-249-441-11	CARBON	100K	5%	1/6W	
R105	1-247-829-00	CARBON	820	5%	1/6W	
R106	1-249-417-11	CARBON	1K	5%	1/6W	
R107	1-249-429-11	CARBON	10K	5%	1/6W	
R108	1-249-429-11	CARBON	10K	5%	1/6W	
R109	1-247-829-00	CARBON	820	5%	1/6W	
R111	1-249-433-11	CARBON	22K	5%	1/6W	
R112	1-249-417-11	CARBON	1K	5%	1/6W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R113	1-247-819-00	CARBON	330	5%	1/6W	
R114	1-249-417-11	CARBON	1K	5%	1/6W	
R115	1-249-417-11	CARBON	1K	5%	1/6W	
R116	1-249-435-11	CARBON	33K	5%	1/6W	
R117	1-249-437-11	CARBON	47K	5%	1/6W	
R118	1-249-437-11	CARBON	47K	5%	1/6W	
R119	1-247-694-11	CARBON	33	5%	1/4W	F
R120	1-247-883-00	CARBON	150K	5%	1/6W	
R121	1-249-417-11	CARBON	1K	5%	1/6W	
R122	1-249-405-11	CARBON	100	5%	1/6W	
R123	1-249-419-11	CARBON	1.5K	5%	1/6W	
R124	1-249-429-11	CARBON	10K	5%	1/6W	
R125	1-249-425-11	CARBON	4.7K	5%	1/6W	
R126	1-249-417-11	CARBON	1K	5%	1/6W	
R127	1-249-417-11	CARBON	1K	5%	1/6W	
R128	1-249-429-11	CARBON	10K	5%	1/6W	
R129	1-249-429-11	CARBON	10K	5%	1/6W	
R130	1-247-895-00	CARBON	470K	5%	1/6W	
R131	1-249-437-11	CARBON	47K	5%	1/6W	
R132	1-249-435-11	CARBON	33K	5%	1/6W	
R133	1-249-437-11	CARBON	47K	5%	1/6W	
R135	1-249-429-11	CARBON	10K	5%	1/6W	
R140	1-247-823-00	CARBON	470	5%	1/6W	
R141	1-249-429-11	CARBON	10K	5%	1/6W	
R142	1-249-437-11	CARBON	47K	5%	1/6W	
R143	1-249-441-11	CARBON	100K	5%	1/6W	
R144	1-247-849-00	CARBON	5.6K	5%	1/6W	
R145	1-247-849-00	CARBON	5.6K	5%	1/6W	
R146	1-249-437-11	CARBON	47K	5%	1/6W	
R201	1-249-441-11	CARBON	100K	5%	1/6W	
R202	1-249-441-11	CARBON	100K	5%	1/6W	
R203	1-249-441-11	CARBON	100K	5%	1/6W	
R204	1-249-437-11	CARBON	47K	5%	1/6W	
R205	1-249-437-11	CARBON	47K	5%	1/6W	
R206	1-249-435-11	CARBON	33K	5%	1/6W	
R207	1-247-873-00	CARBON	56K	5%	1/6W	
R208	1-249-405-11	CARBON	100	5%	1/6W	
R209	1-249-405-11	CARBON	100	5%	1/6W	
R210	1-247-694-11	CARBON	33	5%	1/4W	F
R211	1-247-694-11	CARBON	33	5%	1/4W	F
R212	1-247-809-00	CARBON	120	5%	1/6W	
R213	1-249-437-11	CARBON	47K	5%	1/6W	
R214	1-249-429-11	CARBON	10K	5%	1/6W	
R215	1-215-445-00	METAL	10K	1%	1/6W	
R216	1-215-461-00	METAL	47K	1%	1/6W	
R217	1-215-445-00	METAL	10K	1%	1/6W	
R218	1-215-461-00	METAL	47K	1%	1/6W	
R219	1-249-437-11	CARBON	47K	5%	1/6W	
R220	1-247-849-00	CARBON	5.6K	5%	1/6W	
R221	1-249-441-11	CARBON	100K	5%	1/6W	
R222	1-249-441-11	CARBON	100K	5%	1/6W	
R223	1-249-441-11	CARBON	100K	5%	1/6W	
R224	1-249-429-11	CARBON	10K	5%	1/6W	

Ref.No	Part No.	Description				Remark
R225	1-249-440-11	CARBON	82K	5%	1/6W	
R226	1-249-429-11	CARBON	10K	5%	1/6W	
R227	1-249-429-11	CARBON	10K	5%	1/6W	
R228	1-249-429-11	CARBON	10K	5%	1/6W	
R229	1-247-849-00	CARBON	5.6K	5%	1/6W	
R230	1-249-441-11	CARBON	100K	5%	1/6W	
R231	1-249-429-11	CARBON	10K	5%	1/6W	
R232	1-249-437-11	CARBON	47K	5%	1/6W	
R233	1-249-429-11	CARBON	10K	5%	1/6W	
R235	1-249-422-11	CARBON	2.7K	5%	1/6W	
R238	1-249-437-11	CARBON	47K	5%	1/6W	
R239	1-249-437-11	CARBON	47K	5%	1/6W	
R240	1-249-437-11	CARBON	47K	5%	1/6W	
R241	1-249-447-11	CARBON	1	5%	1/4W	

VARIABLE RESISTOR

RV2	1-224-251-XX	RES, ADJ, METAL GLAZE	4.7K
RV3	1-224-249-XX	RES, ADJ, METAL GLAZE	1K
RV4	1-224-249-XX	RES, ADJ, METAL GLAZE	1K
RV201	1-224-255-XX	RES, ADJ, METAL GLAZE	100K
RV202	1-224-252-XX	RES, ADJ, METAL GLAZE	10K

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	*A-6421-040-B	SY-30 BOARD, COMPLETE
		**********
SP1	*3-683-631-01	CLAMP
SP2	*3-683-631-01	CLAMP

CAPACITOR

C1	1-161-057-00	CERAMIC	0.033MF	10%	25V
C2	1-161-057-00	CERAMIC	0.033MF	10%	25V
C3	1-130-471-00	MYLAR	0.001MF	5%	50V
C4	1-161-057-00	CERAMIC	0.033MF	10%	25V
C5	1-102-106-00	CERAMIC	100PF	10%	50V
C6	1-102-106-00	CERAMIC	100PF	10%	50V
C7	1-161-057-00	CERAMIC	0.033MF	10%	25V
C8	1-130-493-00	MYLAR	0.068MF	5%	50V
C9	1-130-471-00	MYLAR	0.001MF	5%	50V
C10	1-102-106-00	CERAMIC	100PF	10%	50V
C11	1-102-106-00	CERAMIC	100PF	10%	50V
C12	1-161-057-00	CERAMIC	0.033MF	10%	25V
C13	1-123-821-00	ELECT	47MF	20%	16V
C14	1-130-471-00	MYLAR	0.001MF	5%	50V
C15	1-131-347-00	ELECT(SOLID)	1MF	10%	25V
C16	1-123-821-00	ELECT	47MF	20%	16V
C17	1-123-661-00	ELECT	100MF	20%	6.3V
C18	1-123-821-00	ELECT	47MF	20%	16V
C19	1-131-347-00	ELECT(SOLID)	1MF	10%	25V
C20	1-161-057-00	CERAMIC	0.033MF	10%	25V
C21	1-161-057-00	CERAMIC	0.033MF	10%	25V
C22	1-161-057-00	CERAMIC	0.033MF	10%	25V
C23	1-123-661-00	ELECT	100MF	20%	6.3V
C24	1-161-057-00	CERAMIC	0.033MF	10%	25V
C25	1-107-158-00	MICA	30PF	5%	500V
C26	1-107-158-00	MICA	30PF	5%	500V

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
C27	1-161-057-00	CERAMIC	0.033MF	10%	25V	
C28	1-131-347-00	ELECT(SOLID)	1MF	10%	25V	
C29	1-161-057-00	CERAMIC	0.033MF	10%	25V	
C30	1-161-057-00	CERAMIC	0.033MF	10%	25V	
C31	1-161-057-00	CERAMIC	0.033MF	10%	25V	
C32	1-161-057-00	CERAMIC	0.033MF	10%	25V	
C33	1-123-661-00	ELECT	100MF	20%	6.3V	
C34	1-161-057-00	CERAMIC	0.033MF	10%	25V	
C35	1-107-085-00	MICA	100PF	5%	50V	
C36	1-161-057-00	CERAMIC	0.033MF	10%	25V	
C37	1-123-820-00	ELECT	33MF	20%	16V	
C38	1-107-158-00	MICA	30PF	5%	500V	
C39	1-107-158-00	MICA	30PF	5%	500V	
C40	1-123-661-00	ELECT	100MF	20%	6.3V	
C50	1-123-333-00	ELECT	100MF	20%	16V	
		CONNECTOR				
CN1	*1-564-009-00	PIN, CONNECTOR 10P				
CN2	*1-564-007-00	PIN, CONNECTOR 8P				
CN3	*1-564-009-00	PIN, CONNECTOR 10P				
CN4	1-564-002-00	PIN, CONNECTOR 3P				
CN5	*1-564-006-11	PIN, CONNECTOR 7P				
CN6	*1-564-009-00	PIN, CONNECTOR 10P				
CN7	*1-564-009-00	PIN, CONNECTOR 10P				
CN8	*1-564-011-11	PIN, CONNECTOR 12P				
CN9	*1-564-007-00	PIN, CONNECTOR 8P				
CN10	*1-564-007-00	PIN, CONNECTOR 8P				
CN11	*1-564-009-00	PIN, CONNECTOR 10P				
CN12	*1-564-069-00	PIN, CONNECTOR 14P				
CN13	*1-564-007-00	PIN, CONNECTOR 8P				
CN14	*1-564-005-00	PIN, CONNECTOR 6P				
		TRIMMER				
CV1	1-141-260-00	TRIMAR, CERAMIC				
		DIODE				
D1	8-719-911-19	DIODE 1SS119				
D2	8-719-911-19	DIODE 1SS119				
D3	8-719-911-19	DIODE 1SS119				
D4	8-719-911-19	DIODE 1SS119				
D5	8-719-911-19	DIODE 1SS119				
D6	8-719-911-19	DIODE 1SS119				
D7	8-719-911-19	DIODE 1SS119				
D8	8-719-911-19	DIODE 1SS119				
D9	8-719-911-19	DIODE 1SS119				
D10	8-719-911-19	DIODE 1SS119				
D11	8-719-911-19	DIODE 1SS119				
D12	8-719-911-19	DIODE 1SS119				

Ref.No	Part No.	Description				Remark
		IC				
IC1	8-759-240-66	IC TC4066BP				
IC2	8-759-990-82	IC TL082CP				
IC3	8-759-240-30	IC TC4030BP				
IC4	8-759-240-11	IC TC4011BP				
IC5	8-759-145-84	IC UPD4584BC				
IC6	8-759-220-04	IC TC40H004P				
IC7	8-759-345-38	IC HD14538BP				
IC8	8-759-951-88	IC SN75188N				
IC9	8-752-320-35	IC CXD1019S				
IC10	8-759-600-24	IC M54543L				
IC11	8-759-240-53	IC TC4053BP				
IC12	8-759-951-89	IC SN75189AN				
IC14	8-759-108-93	IC UPD1511AC				
IC16	8-759-303-82	IC HD6801V5				
IC17	8-759-240-13	IC TC4013BP				
IC18	8-759-200-07	IC TC40H157P				
IC19	8-759-240-49	IC TC4049BP				
IC20	8-759-240-49	IC TC4049BP				
IC21	8-759-182-43	IC UPD8243C				
IC22	8-759-182-43	IC UPD8243C				
IC23	8-759-908-23	IC MB88303				
IC24	8-759-220-04	IC TC40H004P				
IC25	8-759-240-51	IC TC4051BP				
IC26	8-759-240-40	IC TC4040BP				
		IC SOCKET				
ICS16	1-526-662-21	SOCKET, IC (DP) 40P				
		COIL				
L1	1-408-415-00	MICRO INDUCTOR 33UH				
		TRANSISTOR				
Q1	8-729-173-37	TRANSISTOR 2SA733				
Q2	8-729-663-48	TRANSISTOR 2SC1364				
Q3	8-729-663-48	TRANSISTOR 2SC1364				
Q4	8-729-173-37	TRANSISTOR 2SA733				
Q5	8-729-316-16	TRANSISTOR 2SC1061				
Q6	8-729-663-48	TRANSISTOR 2SC1364				
Q7	8-729-177-43	TRANSISTOR 2SD774				
Q8	8-729-663-48	TRANSISTOR 2SC1364				
		RESISTOR				
R1	1-249-429-11	CARBON	10K	5%	1/6W	
R2	1-249-429-11	CARBON	10K	5%	1/6W	
R3	1-249-433-11	CARBON	22K	5%	1/6W	
R4	1-249-429-11	CARBON	10K	5%	1/6W	
R5	1-249-429-11	CARBON	10K	5%	1/6W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R6	1-249-405-11	CARBON	100	5%	1/6W	
R7	1-249-433-11	CARBON	22K	5%	1/6W	
R8	1-247-889-00	CARBON	270K	5%	1/6W	
R9	1-249-433-11	CARBON	22K	5%	1/6W	
R10	1-249-415-11	CARBON	680	5%	1/6W	
R11	1-247-903-00	CARBON	1M	5%	1/6W	
R12	1-249-433-11	CARBON	22K	5%	1/6W	
R13	1-249-433-11	CARBON	22K	5%	1/6W	
R14	1-249-437-11	CARBON	47K	5%	1/6W	
R15	1-247-903-00	CARBON	1M	5%	1/6W	
R16	1-249-441-11	CARBON	100K	5%	1/6W	
R17	1-249-433-11	CARBON	22K	5%	1/6W	
R18	1-249-433-11	CARBON	22K	5%	1/6W	
R19	1-249-433-11	CARBON	22K	5%	1/6W	
R20	1-249-433-11	CARBON	22K	5%	1/6W	
R21	1-247-903-00	CARBON	1M	5%	1/6W	
R22	1-249-425-11	CARBON	4.7K	5%	1/6W	
R23	1-249-433-11	CARBON	22K	5%	1/6W	
R24	1-249-433-11	CARBON	22K	5%	1/6W	
R25	1-249-433-11	CARBON	22K	5%	1/6W	
R26	1-249-433-11	CARBON	22K	5%	1/6W	
R27	1-249-433-11	CARBON	22K	5%	1/6W	
R28	1-247-903-00	CARBON	1M	5%	1/6W	
R29	1-249-441-11	CARBON	100K	5%	1/6W	
R30	1-247-895-00	CARBON	470K	5%	1/6W	
R31	1-249-425-11	CARBON	4.7K	5%	1/6W	
R32	1-249-433-11	CARBON	22K	5%	1/6W	
R33	1-247-817-00	CARBON	270	5%	1/6W	
R34	1-247-817-00	CARBON	270	5%	1/6W	
R35	1-247-817-00	CARBON	270	5%	1/6W	
R36	1-247-817-00	CARBON	270	5%	1/6W	
R37	1-247-817-00	CARBON	270	5%	1/6W	
R38	1-247-817-00	CARBON	270	5%	1/6W	
R39	1-247-817-00	CARBON	270	5%	1/6W	
R40	1-247-817-00	CARBON	270	5%	1/6W	
R41	1-247-817-00	CARBON	270	5%	1/6W	
R42	1-249-433-11	CARBON	22K	5%	1/6W	
R43	1-249-433-11	CARBON	22K	5%	1/6W	
R44	1-249-433-11	CARBON	22K	5%	1/6W	
R45	1-249-433-11	CARBON	22K	5%	1/6W	
R46	1-249-433-11	CARBON	22K	5%	1/6W	
R47	1-249-433-11	CARBON	22K	5%	1/6W	
R48	1-249-433-11	CARBON	22K	5%	1/6W	
R49 ⚠	1-212-364-00	METAL OXIDE	2.2	10%	1W	F
R50	1-249-433-11	CARBON	22K	5%	1/6W	
R51	1-249-433-11	CARBON	22K	5%	1/6W	
R52	1-249-441-11	CARBON	100K	5%	1/6W	
R53	1-249-433-11	CARBON	22K	5%	1/6W	
R54	1-247-903-00	CARBON	1M	5%	1/6W	
R55	1-249-433-11	CARBON	22K	5%	1/6W	
R56	1-249-433-11	CARBON	22K	5%	1/6W	
R57	1-247-817-00	CARBON	270	5%	1/6W	
R58	1-249-433-11	CARBON	22K	5%	1/6W	

Ref.No	Part No.	Description				Remark
R59	1-249-433-11	CARBON	22K	5%	1/6W	
R60	1-249-433-11	CARBON	22K	5%	1/6W	
R61	1-249-433-11	CARBON	22K	5%	1/6W	
R62	1-249-433-11	CARBON	22K	5%	1/6W	
R63	1-249-415-11	CARBON	680	5%	1/6W	
R64	1-249-433-11	CARBON	22K	5%	1/6W	
R65	1-249-425-11	CARBON	4.7K	5%	1/6W	
R66	1-249-433-11	CARBON	22K	5%	1/6W	
R67	1-249-415-11	CARBON	680	5%	1/6W	
R68	1-249-425-11	CARBON	4.7K	5%	1/6W	
R69	1-249-425-11	CARBON	4.7K	5%	1/6W	
R70	1-249-433-11	CARBON	22K	5%	1/6W	
R71	1-249-433-11	CARBON	22K	5%	1/6W	
R72	1-249-433-11	CARBON	22K	5%	1/6W	
R73	1-249-415-11	CARBON	680	5%	1/6W	
R74	1-249-441-11	CARBON	100K	5%	1/6W	
R75	1-249-433-11	CARBON	22K	5%	1/6W	
R76	1-249-441-11	CARBON	100K	5%	1/6W	
R77	1-249-433-11	CARBON	22K	5%	1/6W	
R78	1-249-433-11	CARBON	22K	5%	1/6W	
R79	1-249-433-11	CARBON	22K	5%	1/6W	
R80	1-249-433-11	CARBON	22K	5%	1/6W	
R81	1-249-433-11	CARBON	22K	5%	1/6W	
R82	1-249-433-11	CARBON	22K	5%	1/6W	
R83	1-249-433-11	CARBON	22K	5%	1/6W	
R84	1-249-433-11	CARBON	22K	5%	1/6W	
R85	1-249-433-11	CARBON	22K	5%	1/6W	
R86	1-249-433-11	CARBON	22K	5%	1/6W	
R87	1-249-433-11	CARBON	22K	5%	1/6W	
R88	1-249-441-11	CARBON	100K	5%	1/6W	
R89	1-249-433-11	CARBON	22K	5%	1/6W	
R90	1-249-433-11	CARBON	22K	5%	1/6W	
R91	1-249-433-11	CARBON	22K	5%	1/6W	
R92	1-249-433-11	CARBON	22K	5%	1/6W	
R93	1-249-433-11	CARBON	22K	5%	1/6W	
R94	1-249-433-11	CARBON	22K	5%	1/6W	
R95	1-249-425-11	CARBON	4.7K	5%	1/6W	
R96	1-249-433-11	CARBON	22K	5%	1/6W	
R97	1-249-433-11	CARBON	22K	5%	1/6W	
R98	1-249-433-11	CARBON	22K	5%	1/6W	
R99	1-249-433-11	CARBON	22K	5%	1/6W	
R100	1-247-903-00	CARBON	1M	5%	1/6W	
R101	1-247-839-00	CARBON	2.2K	5%	1/6W	

NETTY, R

RB1	1-231-387-00	NETTY, RES

VARIABLE RESISTOR

RV1	1-224-661-00	RES, ADJ, METAL FILM 47K
RV2	1-224-661-00	RES, ADJ, METAL FILM 47K

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
		CRYSTAL			
X1	1-527-822-00	OSCILLATOR, CERAMIC (4MHz)			
X2	1-527-827-00	OSCILLATOR, CRYSTAL (4.9152MHz)			
**********					
	*A-6421-044-B	SV-69 BOARD, COMPLETE			
		**********			
	3-671-893-00	CLAMP (LOW TYPE)			
	3-671-893-00	CLAMP (LOW TYPE)			
	*3-688-396-01	CASE (1), SHIELD, SV-69			
	*3-688-398-02	CASE (3), SHIELD, SV-69			
		CAPACITOR			
C1	1-130-471-00	MYLAR	0.001MF	5%	50V
C2	1-130-479-00	MYLAR	0.0047MF	5%	50V
C3	1-107-085-00	MICA	100PF	5%	50V
C4	1-123-611-00	ELECT	1MF	20%	50V
C5	1-102-959-00	CERAMIC	22PF	10%	50V
C6	1-102-106-00	CERAMIC	100PF	10%	50V
C7	1-123-661-00	ELECT	100MF	20%	6.3V
C8	1-123-647-00	ELECT	47MF	20%	6.3V
C9	1-123-821-00	ELECT	47MF	20%	16V
C10	1-123-821-00	ELECT	47MF	20%	16V
C11	1-130-491-00	MYLAR	0.047MF	5%	50V
C12	1-130-483-00	MYLAR	0.01MF	5%	50V
C13	1-130-491-00	MYLAR	0.047MF	5%	50V
C14	1-130-483-00	MYLAR	0.01MF	5%	50V
C15	1-101-001-00	CERAMIC	0.001MF		50V
C17	1-123-647-00	ELECT	47MF	20%	6.3V
C101	1-123-821-00	ELECT	47MF	20%	16V
C102	1-123-821-00	ELECT	47MF	20%	16V
C103	1-107-085-00	MICA	100PF	5%	50V
C104	1-123-822-00	ELECT	47MF	20%	10V
C105	1-123-644-00	ELECT	22MF	20%	10V
C106	1-161-051-00	CERAMIC	0.01MF	10%	50V
C107	1-161-051-00	CERAMIC	0.01MF	10%	50V
C108	1-161-051-00	CERAMIC	0.01MF	10%	50V
C109	1-123-617-00	ELECT	10MF	20%	16V
C110	1-123-644-00	ELECT	22MF	20%	10V
C111	1-161-051-00	CERAMIC	0.01MF	10%	50V
C112	1-161-051-00	CERAMIC	0.01MF	10%	50V
C113	1-161-051-00	CERAMIC	0.01MF	10%	50V
C114	1-161-051-00	CERAMIC	0.01MF	10%	50V
C115	1-123-618-00	ELECT	22MF	20%	6.3V
C116	1-123-647-00	ELECT	47MF	20%	6.3V

Ref.No	Part No.	Description			Remark
C117	1-161-051-00	CERAMIC	0.01MF	10%	50V
C118	1-102-112-00	CERAMIC	330PF	10%	50V
C119	1-102-106-00	CERAMIC	100PF	10%	50V
C121	1-102-110-00	CERAMIC	220PF	10%	50V
C122	1-130-485-00	MYLAR	0.015MF	5%	50V
C123	1-130-478-00	MYLAR	0.0039MF	5%	50V
C124	1-102-108-00	CERAMIC	150PF	10%	50V
C125	1-130-483-00	MYLAR	0.01MF	5%	50V
C126	1-107-087-00	MICA	120PF	5%	50V
C127	1-123-611-00	ELECT	1MF	20%	50V
C128	1-107-077-00	MICA	47PF	5%	50V
C129	1-161-013-00	CERAMIC	0.01MF	10%	25V
C130	1-161-013-00	CERAMIC	0.01MF	10%	25V
C201	1-130-471-00	MYLAR	0.001MF	5%	50V
C202	1-130-471-00	MYLAR	0.001MF	5%	50V
C203	1-130-475-00	MYLAR	0.0022MF	5%	50V
C204	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C205	1-102-074-00	CERAMIC	0.001MF	10%	50V
C206	1-130-482-00	MYLAR	0.0082MF	5%	50V
C207	1-130-483-00	MYLAR	0.01MF	5%	50V
C208	1-130-491-00	MYLAR	0.047MF	5%	50V
C209	1-123-647-00	ELECT	47MF	20%	6.3V
C301	1-123-644-00	ELECT	22MF	20%	10V
C302	1-161-013-00	CERAMIC	0.01MF	10%	25V
C303	1-161-013-00	CERAMIC	0.01MF	10%	25V
C304	1-123-622-00	ELECT	22MF	20%	16V
C305	1-123-647-00	ELECT	47MF	20%	6.3V
C306	1-161-013-00	CERAMIC	0.01MF	10%	25V
C307	1-161-013-00	CERAMIC	0.01MF	10%	25V
C308	1-123-622-00	ELECT	22MF	20%	16V
C309	1-123-647-00	ELECT	47MF	20%	6.3V
C401	1-123-617-00	ELECT	10MF	20%	16V
C402	1-161-013-00	CERAMIC	0.01MF	10%	25V
C403	1-123-609-00	ELECT	0.33MF	20%	50V
C404	1-107-085-00	MICA	100PF	5%	50V
C405	1-107-157-00	MICA	27PF	5%	500V
C406	1-107-157-00	MICA	27PF	5%	500V
C501	1-123-647-00	ELECT	47MF	20%	6.3V
C502	1-130-479-00	MYLAR	0.0047MF	5%	50V
C503	1-130-479-00	MYLAR	0.0047MF	5%	50V
C504	1-130-479-00	MYLAR	0.0047MF	5%	50V
C505	1-130-479-00	MYLAR	0.0047MF	5%	50V
C506	1-161-059-00	CERAMIC	0.047MF	10%	25V
C507	1-123-611-00	ELECT	1MF	20%	50V
C508	1-123-611-00	ELECT	1MF	20%	50V
C509	1-130-483-00	MYLAR	0.01MF	5%	50V
C510	1-123-611-00	ELECT	1MF	20%	50V
C511	1-123-611-00	ELECT	1MF	20%	50V
C512	1-123-611-00	ELECT	1MF	20%	50V
C513	1-130-483-00	MYLAR	0.01MF	5%	50V
C514	1-130-479-00	MYLAR	0.0047MF	5%	50V
C515	1-130-479-00	MYLAR	0.0047MF	5%	50V
C516	1-123-611-00	ELECT	1MF	20%	50V

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
C517	1-161-013-00	CERAMIC	0.01MF	10% 25V	
C518	1-123-647-00	ELECT	47MF	20% 6.3V	
		FILTER			
CF101	1-527-604-00	FILTER, CERAMIC (3.58MHz)			
		CONNECTOR			
CN1	*1-564-005-00	PIN, CONNECTOR 6P			
CN2	*1-564-002-00	PIN, CONNECTOR 3P			
CN3	*1-564-004-00	PIN, CONNECTOR 5P			
CN5	*1-564-007-00	PIN, CONNECTOR 8P			
CN6	*1-564-004-00	PIN, CONNECTOR 5P			
CN7	*1-564-005-00	PIN, CONNECTOR 6P			
CN8	*1-564-005-00	PIN, CONNECTOR 6P			
		TRIMMER			
CV1	1-141-316-11	CAP, CERAMIC TRIMMER			
		DIODE			
D1	8-719-911-19	DIODE 1SS119			
D2	8-719-911-19	DIODE 1SS119			
D3	8-719-911-19	DIODE 1SS119			
D4	8-719-911-19	DIODE 1SS119			
D5	8-719-911-19	DIODE 1SS119			
D6	8-719-911-19	DIODE 1SS119			
D7	8-719-911-19	DIODE 1SS119			
D10	8-719-911-19	DIODE 1SS119			
D11	8-719-151-07	DIODE RD5.1E-B			
D12	8-719-151-07	DIODE RD5.1E-B			
D13	8-719-911-19	DIODE 1SS119			
D14	8-719-911-19	DIODE 1SS119			
D15	8-719-911-19	DIODE 1SS119			
D16	8-719-911-19	DIODE 1SS119			
		IC			
IC1	8-759-902-21	IC SN74LS221N			
IC2	8-759-901-23	IC SN74LS123N			
IC3	8-759-900-00	IC SN74LS00N			
IC4	8-759-901-23	IC SN74LS123N			
IC5	8-759-901-23	IC SN74LS123N			
IC6	8-759-900-74	IC SN74LS74AN			
IC7	8-759-729-03	IC NJM2903D			
IC8	8-759-729-03	IC NJM2903D			
IC10	8-759-250-03	IC TC5003P			
IC11	8-759-990-82	IC TL082CP			
IC12	8-759-990-82	IC TL082CP			
IC13	8-759-900-10	IC SN74LS10N			
IC14	8-759-951-07	IC SN75107AN			
IC15	8-759-729-03	IC NJM2903D			
IC16	8-759-220-04	IC TC40H004P			

Ref.No	Part No.	Description	Remark
IC17	8-759-990-82	IC TL082CP	
IC18	8-759-901-23	IC SN74LS123N	
IC19	8-759-902-21	IC SN74LS221N	
IC20	8-759-969-13	IC SN16913P	
IC21	8-752-006-10	IC CX20061	
IC22	8-759-220-00	IC TC40H000P	
IC23	8-759-220-00	IC TC40H000P	
IC24	8-759-220-04	IC TC40H004P	
IC25	8-759-220-00	IC TC40H000P	
IC26	8-759-708-09	IC NJM78L09A	
IC27	8-759-700-65	IC NJM79L05A	
		COIL	
L1	1-408-409-00	MICRO INDUCTOR 10UH	
L2	1-408-409-00	MICRO INDUCTOR 10UH	
L3	1-408-409-00	MICRO INDUCTOR 10UH	
L4	1-408-409-00	MICRO INDUCTOR 10UH	
L101	1-408-409-00	MICRO INDUCTOR 10UH	
L102	1-408-409-00	MICRO INDUCTOR 10UH	
L103	1-408-409-00	MICRO INDUCTOR 10UH	
L104	1-408-409-00	MICRO INDUCTOR 10UH	
L105	1-408-409-00	MICRO INDUCTOR 10UH	
L201	1-408-409-00	MICRO INDUCTOR 10UH	
L401	1-408-409-00	MICRO INDUCTOR 10UH	
L501	1-408-421-00	MICRO INDUCTOR 100UH	
L502	1-408-409-00	MICRO INDUCTOR 10UH	
		TRANSISTOR	
Q1	8-729-218-43	TRANSISTOR 2SK184-GR	
Q2	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q3	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q4	8-729-245-83	TRANSISTOR 2SC2458	
Q5	8-729-245-83	TRANSISTOR 2SC2458	
Q6	8-729-245-83	TRANSISTOR 2SC2458	
Q7	8-729-245-83	TRANSISTOR 2SC2458	
Q8	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q9	8-729-245-83	TRANSISTOR 2SC2458	
Q10	8-729-245-83	TRANSISTOR 2SC2458	
Q11	8-729-245-83	TRANSISTOR 2SC2458	
Q12	8-729-112-06	TRANSISTOR 2SA1206	
Q13	8-729-245-83	TRANSISTOR 2SC2458	
Q14	8-729-245-83	TRANSISTOR 2SC2458	
Q15	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q17	8-729-245-83	TRANSISTOR 2SC2458	
Q18	8-729-245-83	TRANSISTOR 2SC2458	
Q19	8-729-245-83	TRANSISTOR 2SC2458	
Q20	8-729-245-83	TRANSISTOR 2SC2458	
Q21	8-729-245-83	TRANSISTOR 2SC2458	
Q22	8-729-245-83	TRANSISTOR 2SC2458	
		RESISTOR	
R1	1-247-853-00	CARBON 8.2K 5% 1/6W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R2	1-249-429-11	CARBON	10K	5%	1/6W	
R3	1-249-425-11	CARBON	4.7K	5%	1/6W	
R4	1-249-417-11	CARBON	1K	5%	1/6W	
R5	1-249-425-11	CARBON	4.7K	5%	1/6W	
R6	1-247-839-00	CARBON	2.2K	5%	1/6W	
R7	1-247-839-00	CARBON	2.2K	5%	1/6W	
R8	1-247-849-00	CARBON	5.6K	5%	1/6W	
R9	1-249-441-11	CARBON	100K	5%	1/6W	
R10	1-215-446-00	METAL	11K	1%	1/6W	
R11	1-249-417-11	CARBON	1K	5%	1/6W	
R12	1-249-417-11	CARBON	1K	5%	1/6W	
R13	1-249-437-11	CARBON	47K	5%	1/6W	
R15	1-249-437-11	CARBON	47K	5%	1/6W	
R16	1-249-441-11	CARBON	100K	5%	1/6W	
R17	1-247-823-00	CARBON	470	5%	1/6W	
R18	1-247-839-00	CARBON	2.2K	5%	1/6W	
R19	1-249-433-11	CARBON	22K	5%	1/6W	
R20	1-249-437-11	CARBON	47K	5%	1/6W	
R21	1-249-429-11	CARBON	10K	5%	1/6W	
R22	1-249-441-11	CARBON	100K	5%	1/6W	
R23	1-247-883-00	CARBON	150K	5%	1/6W	
R24	1-249-417-11	CARBON	1K	5%	1/6W	
R25	1-249-419-11	CARBON	1.5K	5%	1/6W	
R26	1-249-419-11	CARBON	1.5K	5%	1/6W	
R27	1-249-417-11	CARBON	1K	5%	1/6W	
R28	1-249-417-11	CARBON	1K	5%	1/6W	
R29	1-249-425-11	CARBON	4.7K	5%	1/6W	
R30	1-249-429-11	CARBON	10K	5%	1/6W	
R31	1-249-425-11	CARBON	4.7K	5%	1/6W	
R32	1-249-432-11	CARBON	18K	5%	1/6W	
R33	1-249-441-11	CARBON	100K	5%	1/6W	
R34	1-249-429-11	CARBON	10K	5%	1/6W	
R35	1-249-429-11	CARBON	10K	5%	1/6W	
R36	1-249-429-11	CARBON	10K	5%	1/6W	
R37	1-249-429-11	CARBON	10K	5%	1/6W	
R38	1-247-849-00	CARBON	5.6K	5%	1/6W	
R39	1-249-441-11	CARBON	100K	5%	1/6W	
R40	1-249-437-11	CARBON	47K	5%	1/6W	
R41	1-249-437-11	CARBON	47K	5%	1/6W	
R42	1-249-441-11	CARBON	100K	5%	1/6W	
R43	1-249-417-11	CARBON	1K	5%	1/6W	
R44	1-249-429-11	CARBON	10K	5%	1/6W	
R45	1-249-429-11	CARBON	10K	5%	1/6W	
R46	1-247-851-00	CARBON	6.8K	5%	1/6W	
R101	1-249-417-11	CARBON	1K	5%	1/6W	
R102	1-249-429-11	CARBON	10K	5%	1/6W	
R103	1-249-415-11	CARBON	680	5%	1/6W	
R104	1-249-425-11	CARBON	4.7K	5%	1/6W	
R105	1-247-839-00	CARBON	2.2K	5%	1/6W	
R106	1-249-425-11	CARBON	4.7K	5%	1/6W	
R107	1-249-425-11	CARBON	4.7K	5%	1/6W	
R108	1-249-417-11	CARBON	1K	5%	1/6W	
R109	1-247-829-00	CARBON	820	5%	1/6W	
R110	1-249-417-11	CARBON	1K	5%	1/6W	
R111	1-247-815-00	CARBON	220	5%	1/6W	
R112	1-249-423-11	CARBON	3.3K	5%	1/6W	
R113	1-249-419-11	CARBON	1.5K	5%	1/6W	
R114	1-249-417-11	CARBON	1K	5%	1/6W	
R115	1-247-811-00	CARBON	150	5%	1/6W	
R116	1-249-417-11	CARBON	1K	5%	1/6W	
R117	1-249-417-11	CARBON	1K	5%	1/6W	
R118	1-249-405-11	CARBON	100	5%	1/6W	
R119	1-249-417-11	CARBON	1K	5%	1/6W	
R120	1-249-417-11	CARBON	1K	5%	1/6W	
R121	1-249-429-11	CARBON	10K	5%	1/6W	
R122	1-249-437-11	CARBON	47K	5%	1/6W	
R123	1-249-417-11	CARBON	1K	5%	1/6W	
R124	1-249-425-11	CARBON	4.7K	5%	1/6W	
R125	1-247-839-00	CARBON	2.2K	5%	1/6W	
R126	1-247-823-00	CARBON	470	5%	1/6W	
R134	1-249-425-11	CARBON	4.7K	5%	1/6W	
R135	1-247-853-00	CARBON	8.2K	5%	1/6W	
R136	1-247-845-00	CARBON	3.9K	5%	1/6W	
R137	1-247-883-00	CARBON	150K	5%	1/6W	
R138	1-249-425-11	CARBON	4.7K	5%	1/6W	
R139	1-249-425-11	CARBON	4.7K	5%	1/6W	
R140	1-247-845-00	CARBON	3.9K	5%	1/6W	
R141	1-247-845-00	CARBON	3.9K	5%	1/6W	
R142	1-249-417-11	CARBON	1K	5%	1/6W	
R143	1-249-417-11	CARBON	1K	5%	1/6W	
R144	1-247-887-00	CARBON	220K	5%	1/6W	
R145	1-249-429-11	CARBON	10K	5%	1/6W	
R146	1-249-419-11	CARBON	1.5K	5%	1/6W	
R147	1-249-437-11	CARBON	47K	5%	1/6W	
R148	1-249-417-11	CARBON	1K	5%	1/6W	
R149	1-247-823-00	CARBON	470	5%	1/6W	
R201	1-247-851-00	CARBON	6.8K	5%	1/6W	
R202	1-247-853-00	CARBON	8.2K	5%	1/6W	
R203	1-247-859-00	CARBON	15K	5%	1/6W	
R204	1-249-429-11	CARBON	10K	5%	1/6W	
R205	1-247-823-00	CARBON	470	5%	1/6W	
R206	1-247-857-00	CARBON	12K	5%	1/6W	
R207	1-247-859-00	CARBON	15K	5%	1/6W	
R208	1-247-873-00	CARBON	56K	5%	1/6W	
R209	1-247-839-00	CARBON	2.2K	5%	1/6W	
R401	1-247-857-00	CARBON	12K	5%	1/6W	
R402	1-247-859-00	CARBON	15K	5%	1/6W	
R403	1-249-429-11	CARBON	10K	5%	1/6W	
R404	1-249-441-11	CARBON	100K	5%	1/6W	
R405	1-247-903-00	CARBON	1M	5%	1/6W	
R501	1-249-429-11	CARBON	10K	5%	1/6W	
R502	1-249-429-11	CARBON	10K	5%	1/6W	
R503	1-215-446-00	METAL	11K	1%	1/6W	
R504	1-215-434-00	METAL	3.6K	1%	1/6W	
R505	1-249-441-11	CARBON	100K	5%	1/6W	
R506	1-249-417-11	CARBON	1K	5%	1/6W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R507	1-249-429-11	CARBON	10K	5%	1/6W	
R508	1-249-429-11	CARBON	10K	5%	1/6W	
R509	1-215-446-00	METAL	11K	1%	1/6W	
R510	1-215-434-00	METAL	3.6K	1%	1/6W	
R511	1-249-441-11	CARBON	100K	5%	1/6W	
R512	1-249-417-11	CARBON	1K	5%	1/6W	
R513	1-247-804-00	CARBON	75	5%	1/6W	
R514	1-249-405-11	CARBON	100	5%	1/6W	
R515	1-247-839-00	CARBON	2.2K	5%	1/6W	
R516	1-247-823-00	CARBON	470	5%	1/6W	
R517	1-249-437-11	CARBON	47K	5%	1/6W	
R518	1-249-437-11	CARBON	47K	5%	1/6W	
R519	1-249-405-11	CARBON	100	5%	1/6W	
R520	1-247-839-00	CARBON	2.2K	5%	1/6W	
R521	1-247-823-00	CARBON	470	5%	1/6W	
R522	1-249-429-11	CARBON	10K	5%	1/6W	
R523	1-249-429-11	CARBON	10K	5%	1/6W	
R524	1-249-429-11	CARBON	10K	5%	1/6W	
R525	1-215-446-00	METAL	11K	1%	1/6W	
R526	1-215-434-00	METAL	3.6K	1%	1/6W	
R527	1-249-441-11	CARBON	100K	5%	1/6W	
R528	1-249-417-11	CARBON	1K	5%	1/6W	
R529	1-249-437-11	CARBON	47K	5%	1/6W	
R530	1-249-437-11	CARBON	47K	5%	1/6W	
R531	1-249-429-11	CARBON	10K	5%	1/6W	
R532	1-249-429-11	CARBON	10K	5%	1/6W	
		VARIABLE RESISTOR				
RV1	1-224-252-XX	RES, ADJ, METAL GLAZE 10K				
RV2	1-224-252-XX	RES, ADJ, METAL GLAZE 10K				
RV3	1-224-252-XX	RES, ADJ, METAL GLAZE 10K				
RV4	1-224-252-XX	RES, ADJ, METAL GLAZE 10K				
RV5	1-224-251-XX	RES, ADJ, METAL GLAZE 4.7K				
RV6	1-224-251-XX	RES, ADJ, METAL GLAZE 4.7K				
		CRYSTAL				
X401	1-527-227-00	OSCILLATOR, CRYSTAL (14.318MHz)				

When indicating parts by reference number, please include the board name.

LDP-2000

SONY®
SERVICE MANUAL

US Model
Canadian Model

Serial No. 110,001 and later

SUPPLEMENT-4

Subject:
- **Optical Block Change**
- **Video Section and Audio Section Change**

- This supplement updatas the service manual to include production changed.
- File this supplement with the service manual.

VIDEO

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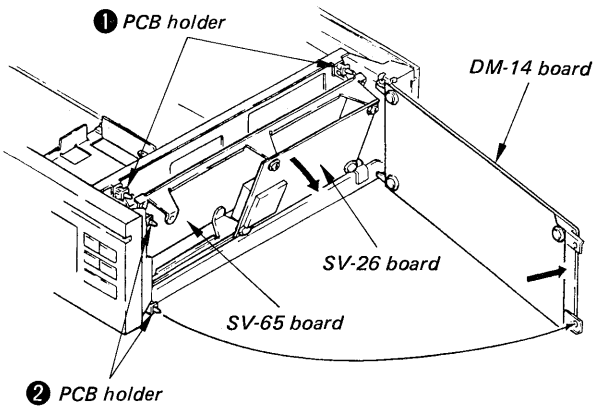
[DISASSEMBLY]

2-3. P.C. BOARDS REMOVAL

- DM-14, SV-26, and SV-65 removal.

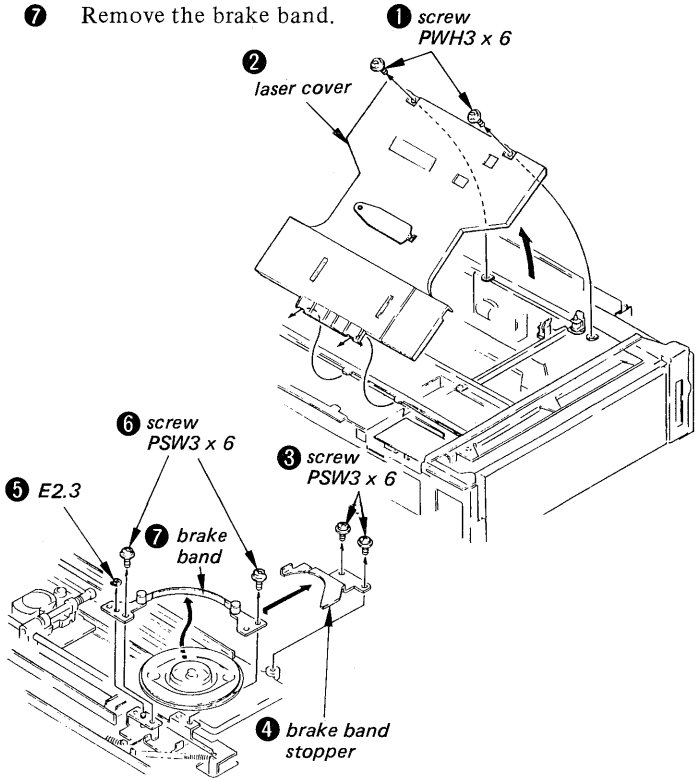
❶ Open DM-14 board in the direction shown by the arrow by removing two PCB holders.

❷ Pull down SV-26 and SV-65 by removing two PCB holders.



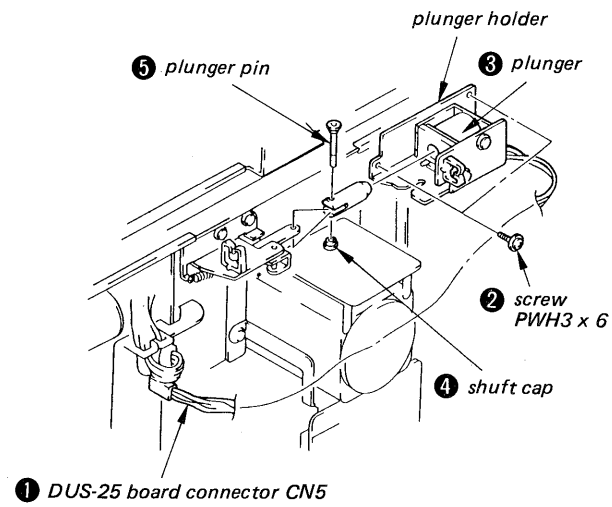
2-5. BRAKE BAND ASSEMBLY REMOVAL

❶ Remove two screws (PWH3 x 6).
❷ Remove the laser cover.
❸ Remove two screws (PSW3 x 6).
❹ Remove the brake band stopper.
❺ Remove E-ring (E2.3).
❻ Remove two screws (PSW3 x 6).
❼ Remove the brake band.



2-7. PLUNGER REMOVAL

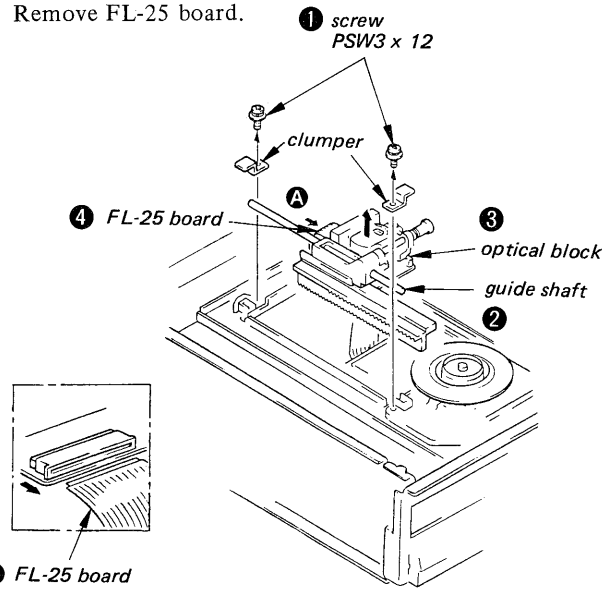
❶ Pull out the connector CN5 on DUS-25 board.
❷ Remove two screws (PWH3 x 6).
❸ Remove the plunger with the plunger holder.
❹ Remove the shaft cap.
❺ Remove the plunger pin.



2-9. OPTICAL BLOCK

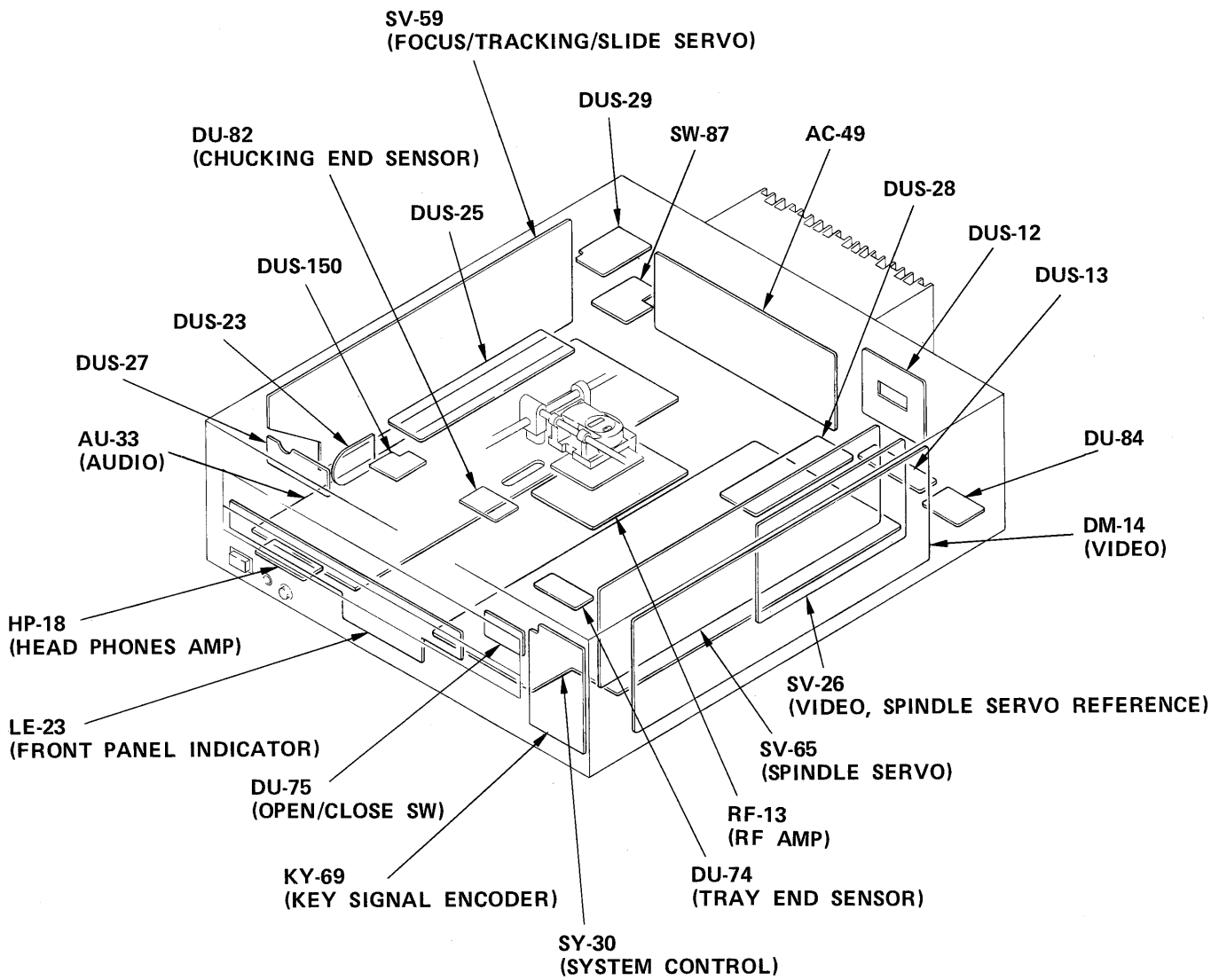
2-9-1. Optical Block Removal

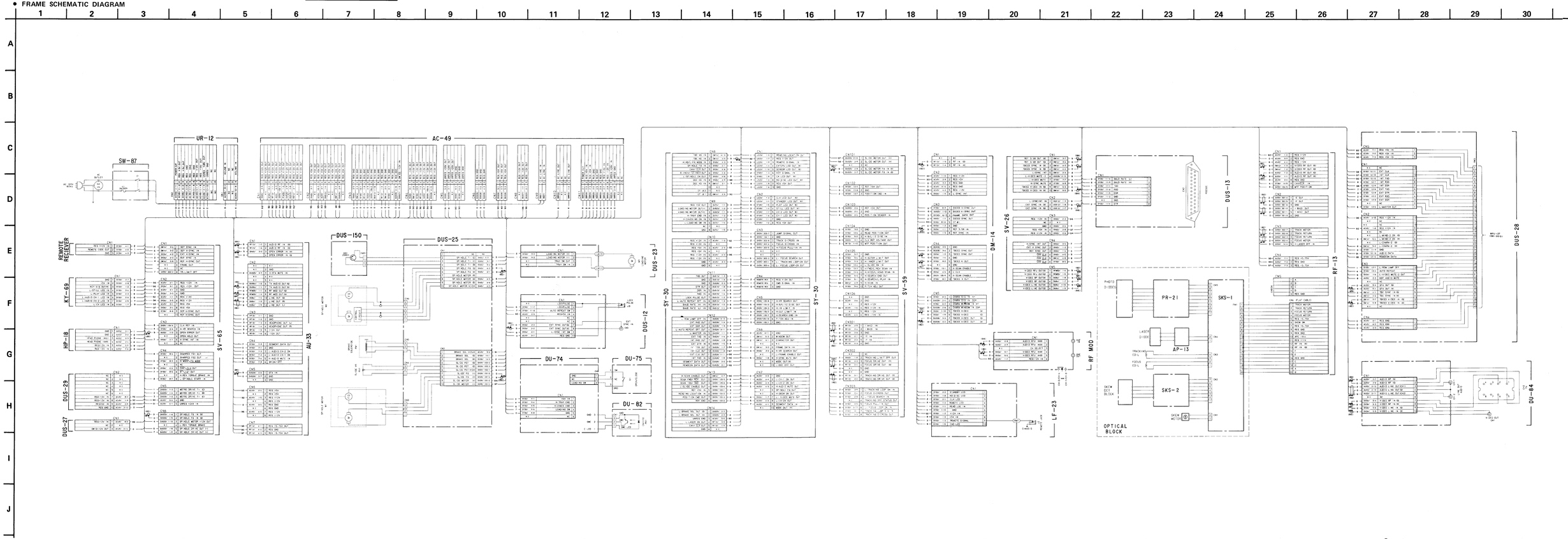
❶ Remove the clumper by removing two screws (PSW3 x 12).
❷ Remove the guide shaft.
❸ Pull out the optical block.
❹ Remove FL-25 board.



• *Remove FL-25 board by pulling out the connector in the direction shown by the arrow Ⓐ.*

[CIRCUIT BOARDS LOCATION]




UR-12
AC-49
SW-87
REMOTE RECEIVER
KY-69
HP-18
DUS-29
DUS-27
SY-65
AU-33
DUS-150
DUS-25
DUS-23
SY-30
DUS-12
DU-74
DU-75
DU-82
SY-99
DM-14
SY-26
DUS-13
RF-13
RF MOD
LF-23
PR-21
AP-13
SKS-1
SKS-2
OPTICAL BLOCK
DUS-28
DU-84

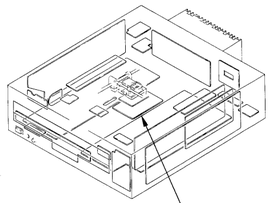
• RF-13 (RF AMP) PRINTED WIRING BOARD

– Ref. No. RF-13 BOARD: 1,000 series –

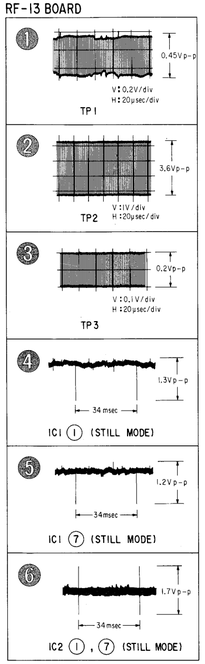
Note on Printed Wiring Board:

- ○— : indicates a lead wire mounted on the component side.
- ▒▒ : soldering side.

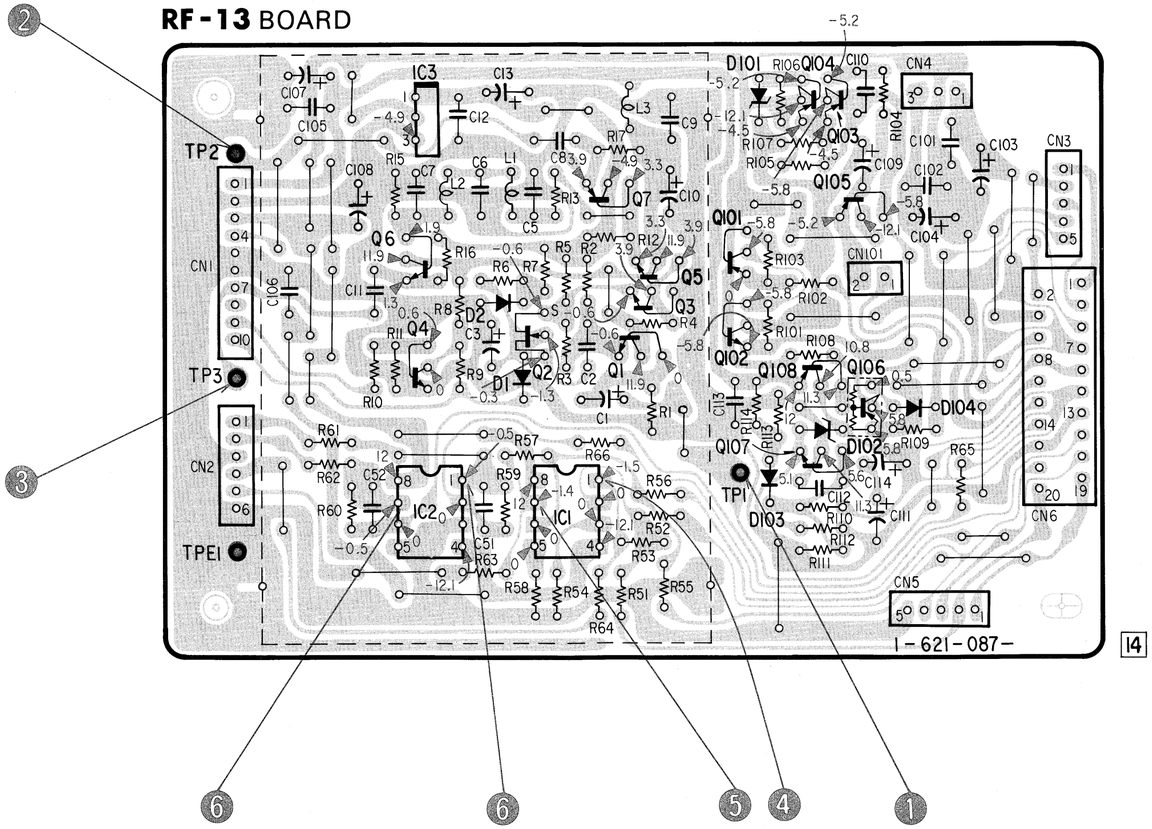
When indicating parts by reference number, please include the board name.



RF-13 BOARD

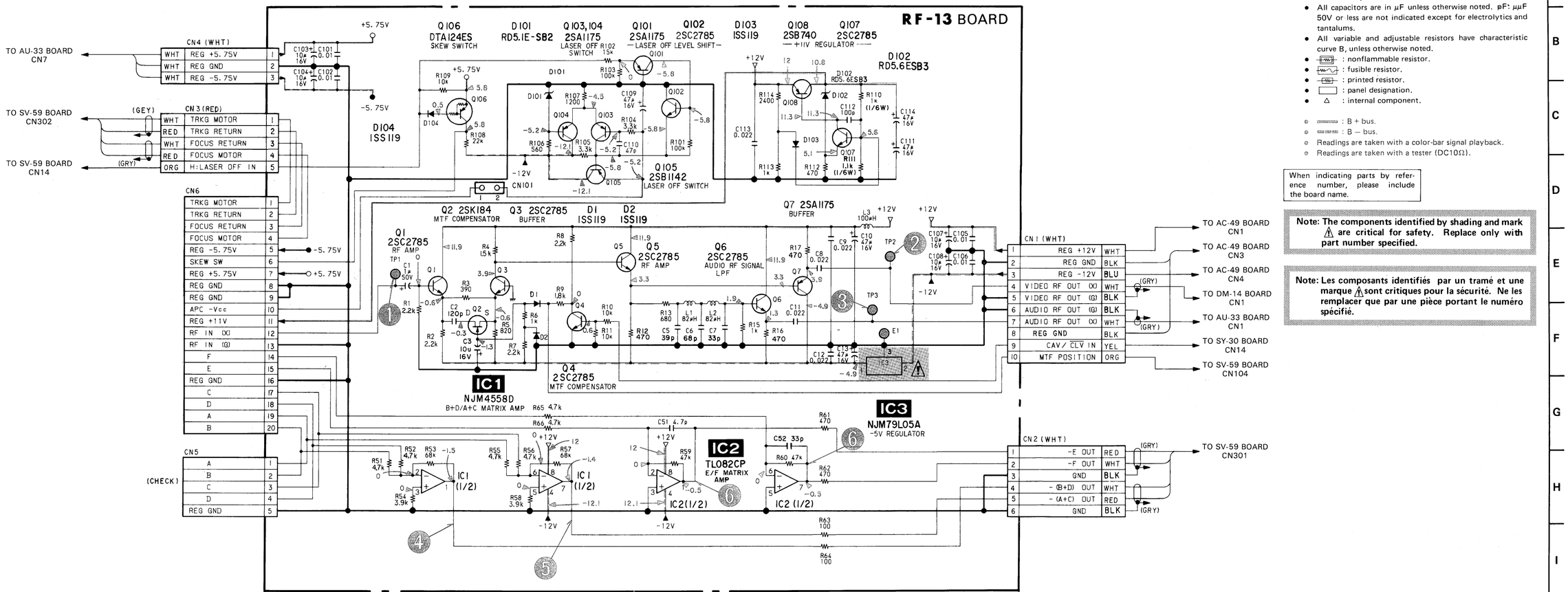


RF-13 BOARD



- **RF-13 (RF AMP) SCHEMATIC DIAGRAM**

– Ref. No. RF-13 BOARD: 1,000 series –



Note on Schematic Diagram:

- All resistors are in ohms, 1/4W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : nonflammable resistor.
- : fusible resistor.
- : printed resistor.
- : panel designation.
- △ : internal component.

- : B + bus.
- : B – bus.
- Readings are taken with a color-bar signal playback.
- Readings are taken with a tester (DC10Ω).

When indicating parts by reference number, please include the board name.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

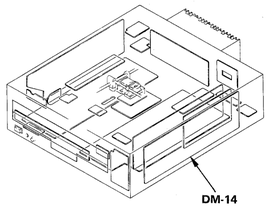
• DM-14 (VIDEO PROCESS) PRINTED WIRING BOARD

– Ref. No. DM-14 BOARD: 4,000 series –

Note:

- ○— : indicates a lead wire mounted on the component side.
- ▒▒ : soldering side.

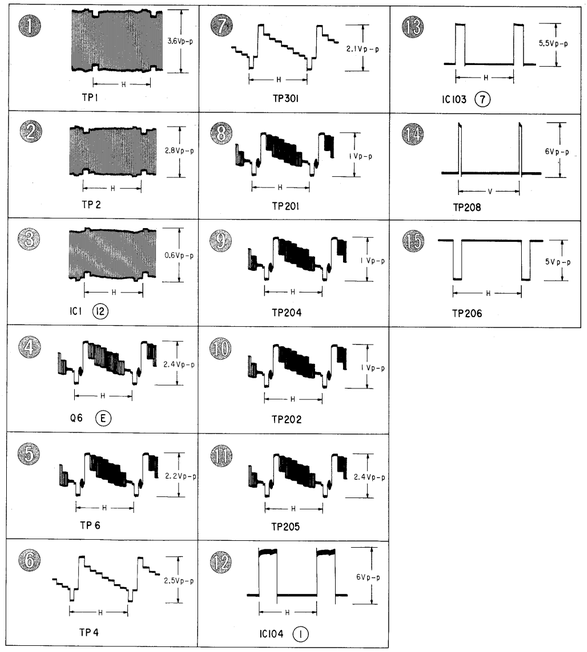
When indicating parts by reference number, please include the board name.

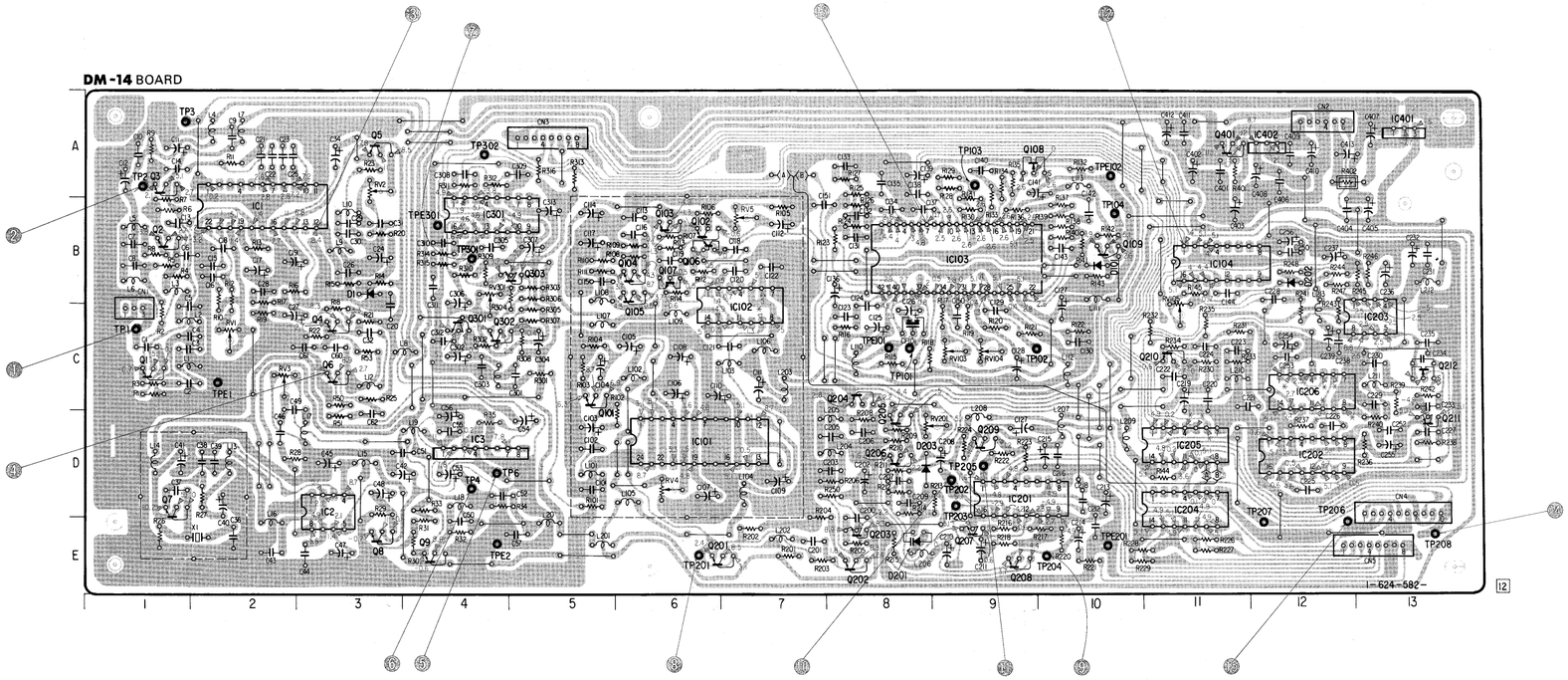


DM-14 BOARD

CN1	C-1	Q1	C-1	RV1	C-2		
CN2	A-12	Q2	B-1	RV2	A-3		
CN3	A-5	Q3	A-1	RV3	C-2		
CN4	D-13	Q4	C-3	RV4	D-6		
CN5	E-13	Q5	A-3	RV5	B-7		
		Q6	C-3	RV103	C-9		
D1	B-3	Q7	E-1	RV104	C-9		
D101	B-10	Q8	E-3	RV105	C-11		
D201	E-8	Q9	E-4	RV201	D-8		
D202	B-12	Q101	C-5	RV301	B-4		
D203	D-8	Q102	B-6				
		Q103	B-6	TP1	C-1		
IC1	B-2	Q104	B-6	TP2	A-1		
IC2	D-3	Q105	B-6	TP3	A-1		
IC3	D-4	Q106	B-6	TP4	D-4		
IC101	D-6	Q107	B-6	TP6	D-4		
IC102	C-7	Q108	A-9	TP101	C-8		
IC103	B-9	Q109	B-10	TP102	C-9		
IC104	B-11	Q201	E-6	TP103	A-9		
IC201	D-9	Q202	E-8	TP104	B-10		
IC202	D-12	Q203	E-8	TP201	E-6		
IC203	C-13	Q204	C-8	TP202	D-9		
IC204	D-11	Q205	D-8	TP203	D-9		
IC205	D-11	Q206	D-8	TP204	E-10		
IC206	C-12	Q207	E-9	TP205	D-9		
IC301	B-4	Q208	E-9	TP206	E-12		
IC401	A-13	Q209	D-9	TP207	E-12		
IC402	A-12	Q210	C-11	TP208	E-13		
		Q211	D-13	TP301	B-4		
		Q212	C-13	TP302	A-4		
		Q301	C-4				
		Q302	C-4	TPE1	C-2		
		Q303	B-5	TPE2	E-4		
		Q401	A-11	TPE101	C-8		
				TPE102	A-10		
				TPE201	E-10		
				TPE301	B-4		

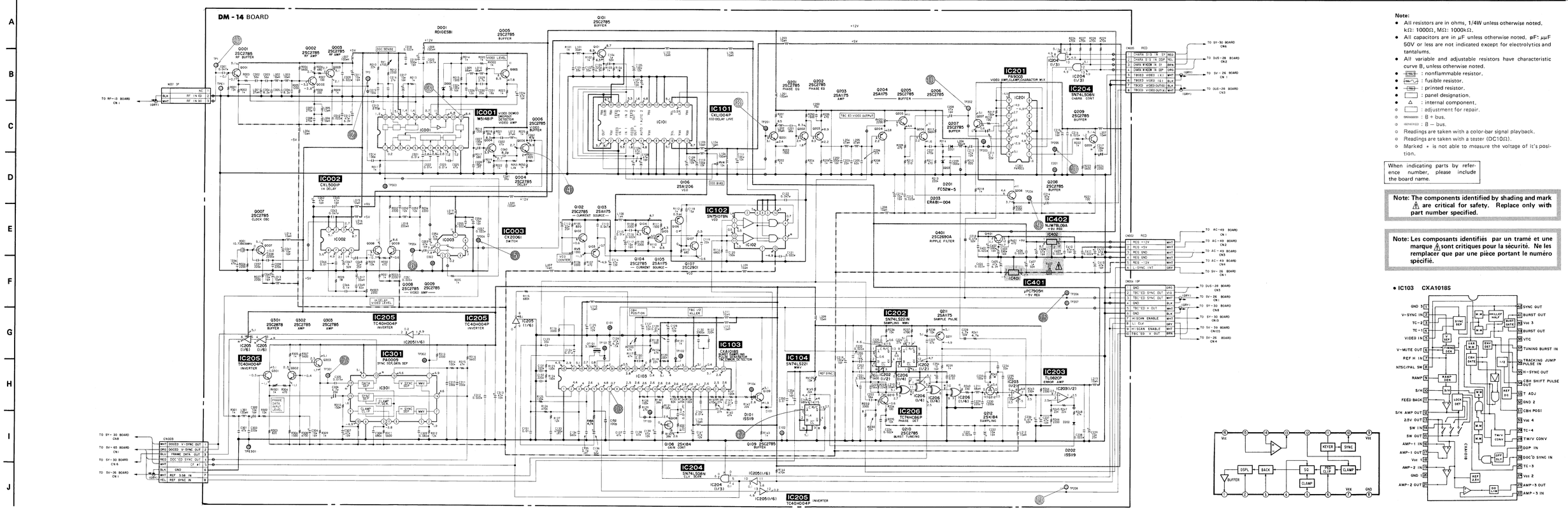
DM-14 BOARD





• DM-14 (VIDEO PROCESS) SCHEMATIC DIAGRAM

– Ref. No. DM-14 BOARD: 4,000 series –



Note:

- All resistors are in ohms, 1/4W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in µF unless otherwise noted. pF: µµF. 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : nonflammable resistor.
- : fusible resistor.
- : printed resistor.
- : panel designation.
- : internal component.
- : adjustment for repair.
- : B + bus.
- : B – bus.
- Readings are taken with a color-bar signal playback.
- Readings are taken with a tester (DC1Ω□).
- Marked ⋆ is not able to measure the voltage of it's position.

When indicating parts by reference number, please include the board name.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

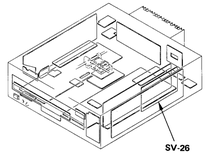
VIDEO, SERVO VIDEO, SERVO

- SV-26 (VIDEO, SPINDLE SERVO REFERENCE) PRINTED WIRING BOARD
  – Ref. No. SV-26 BOARD: 3,000 series –

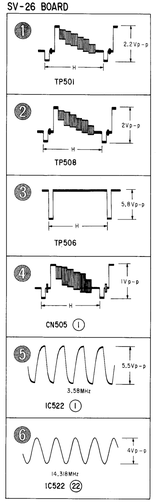
Note:

- ○— : indicates a lead wire mounted on the component side.
- ▒▒ : soldering side.

When indicating parts by reference number, please include the board name.



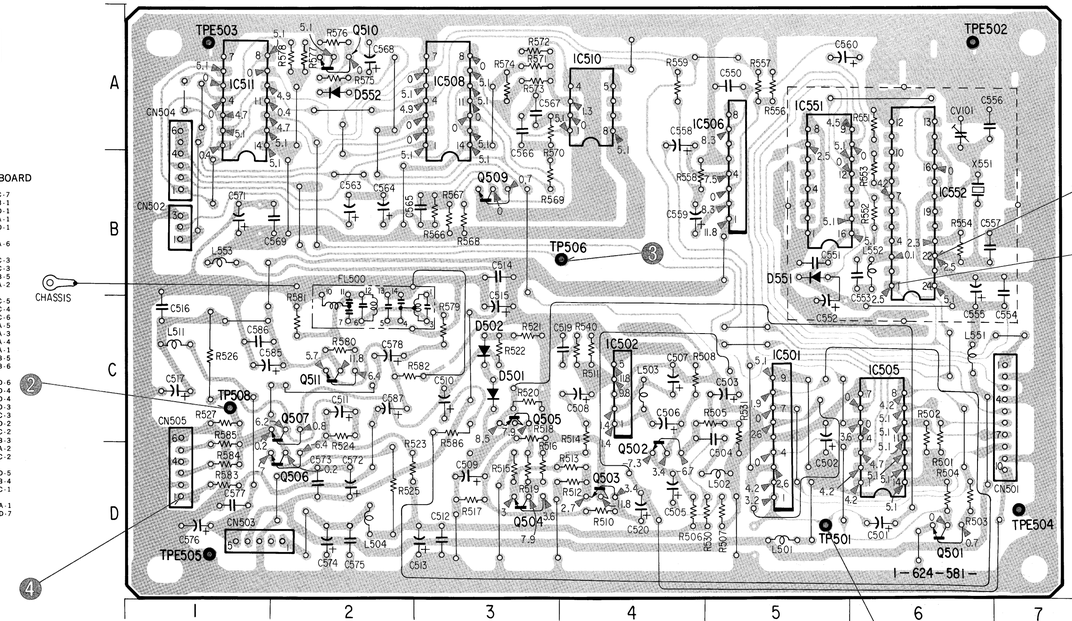
SV-26 BOARD



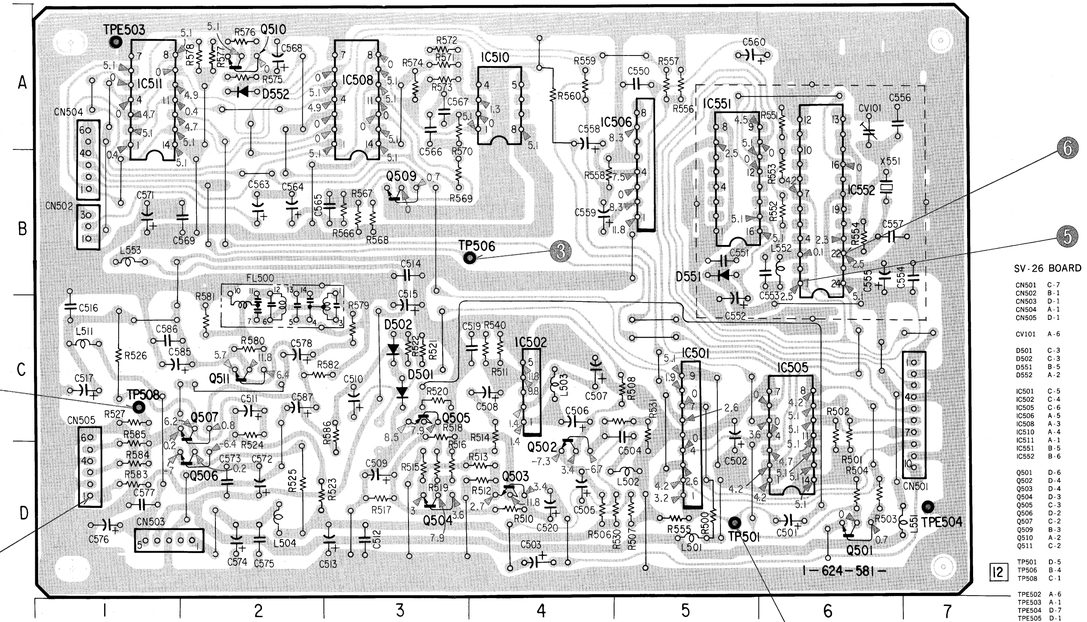
SV-26 BOARD

CN501	C-7
CN502	B-1
CN503	D-1
CN504	A-1
CN505	D-1
CV101	A-6
D501	C-3
D502	C-3
D551	B-5
D552	A-2
IC501	C-5
IC502	C-4
IC505	C-6
IC506	A-5
IC508	A-3
IC510	A-4
IC511	A-1
IC551	B-5
IC552	B-6
Q501	D-6
Q502	D-4
Q503	D-4
Q504	D-3
Q505	C-3
Q506	D-2
Q507	C-2
Q509	B-3
Q510	A-2
Q511	C-2
TP501	D-5
TP506	B-4
TP508	C-1
TPE503	A-1
TPE504	D-7

SV - 26 BOARD



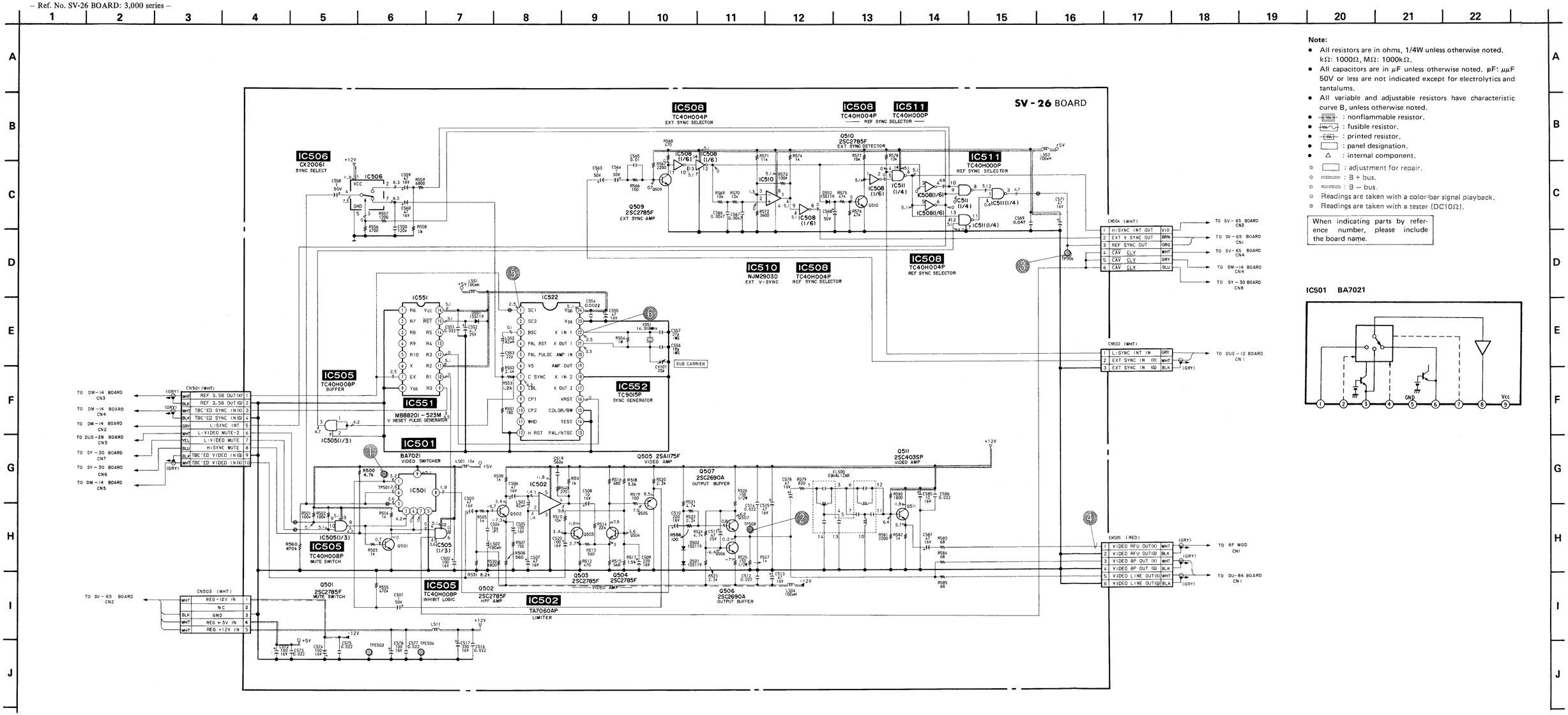
SV - 26 BOARD



SV-26 BOARD

CN501	C-7
CN502	B-1
CN503	D-1
CN504	A-1
CN505	D-1
CV101	A-6
D501	C-3
D502	C-3
D551	B-5
D552	A-2
IC501	C-5
IC502	C-4
IC505	C-6
IC506	A-5
IC508	A-3
IC510	A-4
IC511	A-1
IC551	B-5
IC552	B-6
Q501	D-6
Q502	D-4
Q503	D-4
Q504	D-3
Q505	C-3
Q506	D-2
Q507	C-2
Q509	B-3
Q510	A-2
Q511	C-2
TP501	D-5
TP506	B-4
TP508	C-1
TPE502	A-6
TPE503	A-1
TPE504	D-7
TPE505	D-1

- **SV-26 (VIDEO, SPINDLE SERVO REFERENCE) SCHEMATIC DIAGRAM**
  – Ref. No. SV-26 BOARD: 3,000 series –



Note:

- All resistors are in ohms, 1/4W unless otherwise noted.
  kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : nonflammable resistor.
- : fusible resistor.
- : printed resistor.
- : panel designation.
- △ : internal component.
- : adjustment for repair.
- : B + bus.
- : B – bus.
- Readings are taken with a color-bar signal playback.
- Readings are taken with a tester (DC10Ω).

When indicating parts by reference number, please include the board name.

IC501 BA7021

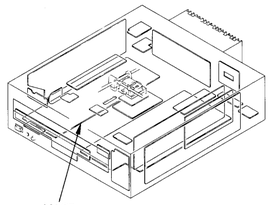
• AU-33 (AUDIO) PRINTED WIRING BOARD

– Ref. No. AU-33 BOARD: 2,000 series –

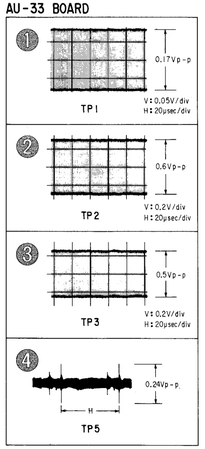
Note:

- ○— : indicates a lead wire mounted on the component side.
- ▨ : soldering side.

When indicating parts by reference number, please include the board name.



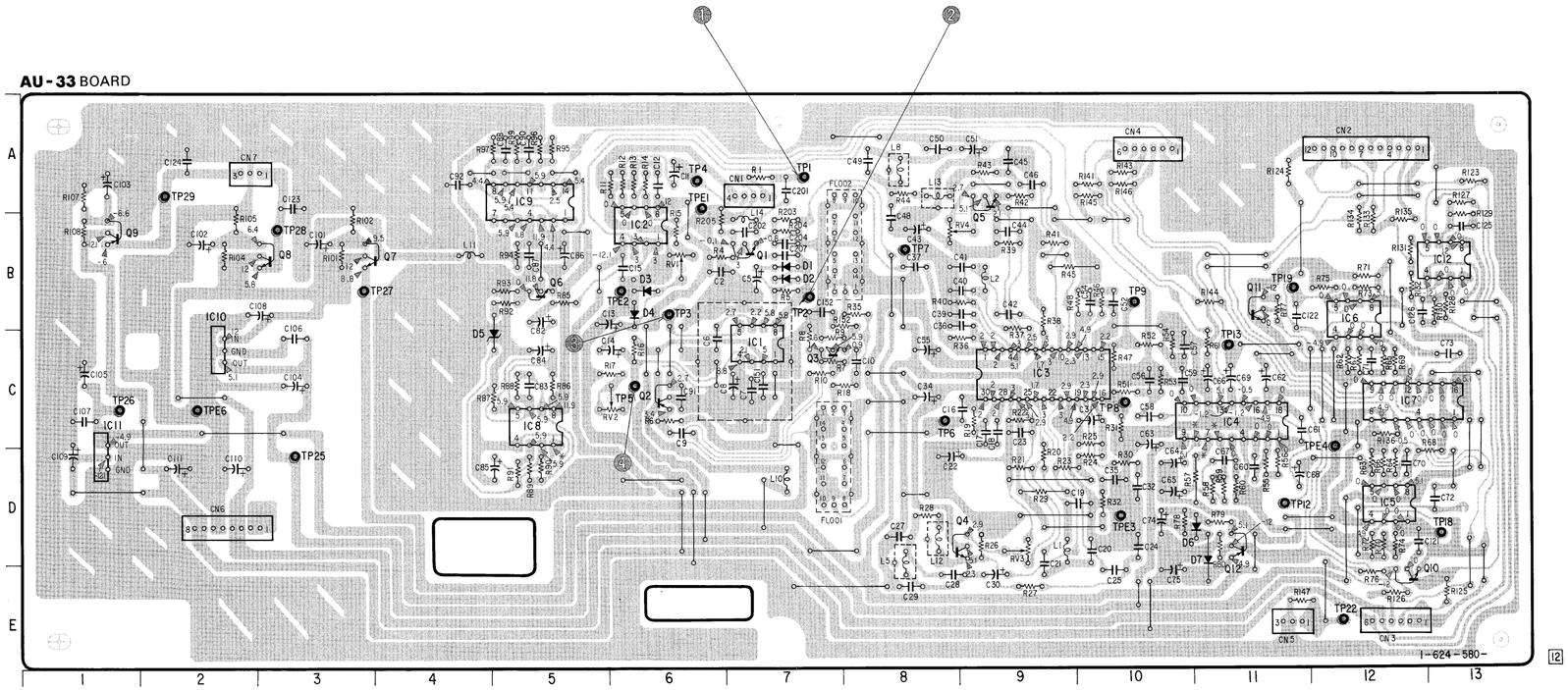
AU-33 BOARD



AU-33 BOARD

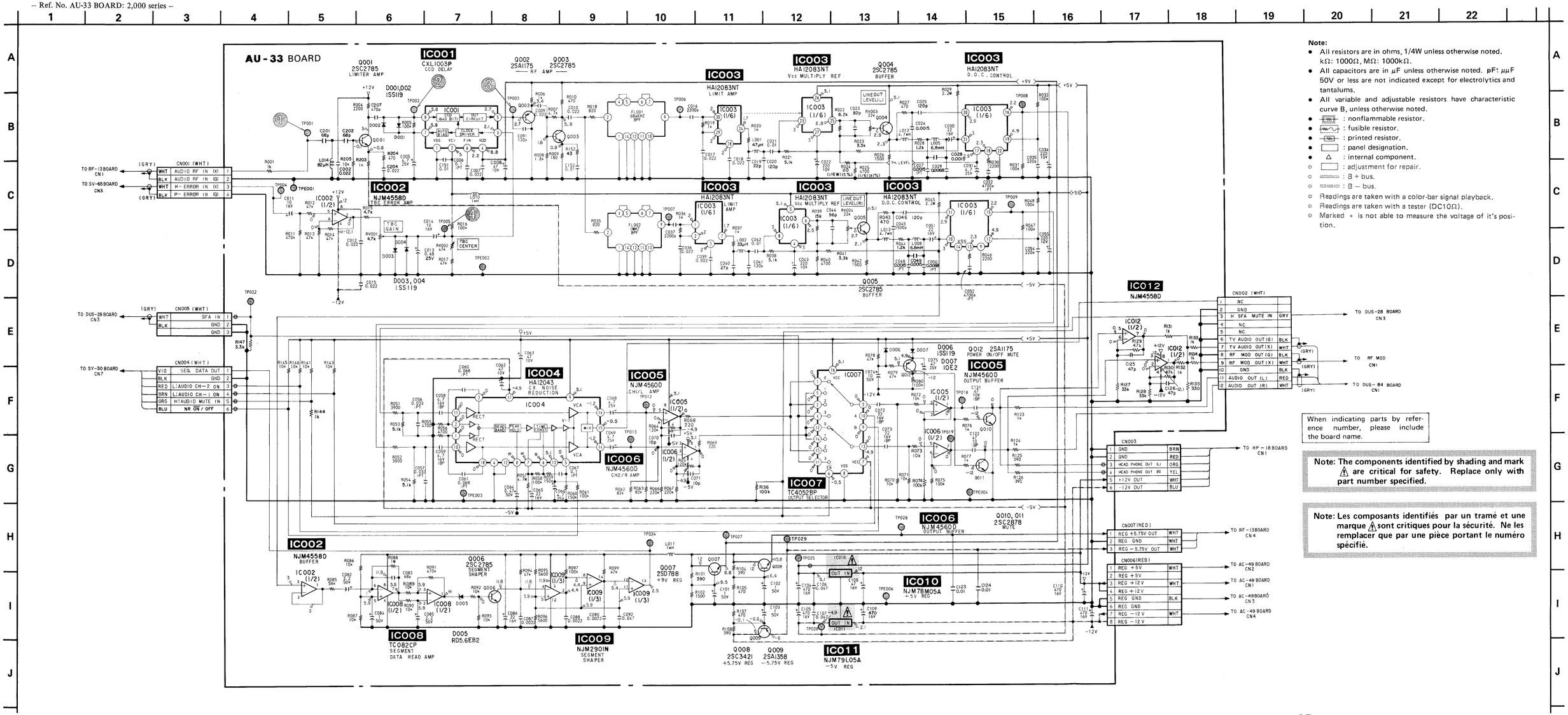
CN1	A-7
CN2	A-12
CN3	E-12
CN4	A-10
CN5	E-11
CN6	D-2
CN7	A-2
D1	B-7
D2	B-7
D3	B-6
D4	B-6
D5	C-5
D6	D-11
D7	D-11
IC1	C-7
IC2	B-6
IC3	C-9
IC4	C-11
IC5	D-12
IC6	B-12
IC7	C-12
IC8	C-5
IC9	A-5
IC10	C-2
IC11	C-1
IC12	B-13
Q1	B-7
Q2	C-6
Q3	C-7
Q4	D-9
Q5	A-9
Q6	B-5
Q7	B-3
Q8	B-3
Q9	B-1
Q10	E-12
Q11	B-11
Q12	D-11
RV1	B-6
RV2	C-6
RV3	D-9
RV4	B-8
TP1	A-7
TP2	B-7
TP3	B-6
TP4	A-6
TP5	C-6
TP6	C-8
TP7	B-8
TP8	C-10
TP9	B-10
TP12	D-11
TP13	C-11
TP18	D-13
TP19	B-11
TP22	E-12
TP24	A-5
TP25	D-3
TP26	C-1
TP27	B-3
TP28	B-3
TP29	A-2
TPE1	A-6
TPE2	B-6
TPE3	D-10
TPE4	C-12
TPE6	C-2

AU-33 BOARD



- **AU-33 (AUDIO) SCHEMATIC DIAGRAM**

– Ref. No. AU-33 BOARD: 2,000 series –



Note:

- All resistors are in ohms, 1/4W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : nonflammable resistor.
- : fusible resistor.
- : printed resistor.
- : panel designation.
- : internal component.
- : adjustment for repair.
- : B + bus.
- : B – bus.
- Readings are taken with a color-bar signal playback.
- Readings are taken with a tester (DC1Ω2).
- Marked * is not able to measure the voltage of it's position.

When indicating parts by reference number, please include the board name.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

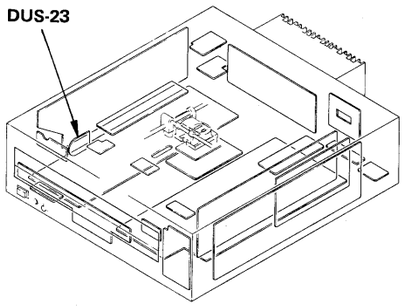
• DUS-23 PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

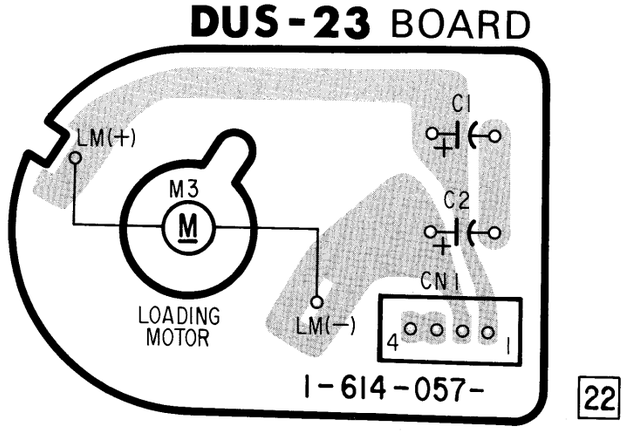
– Ref. No. DUS-23 BOARD: 5,000 series –

Note:

- ○— : indicates a lead wire mounted on the component side.
- ▒▒ : soldering side.

When indicating parts by reference number, please include the board name.

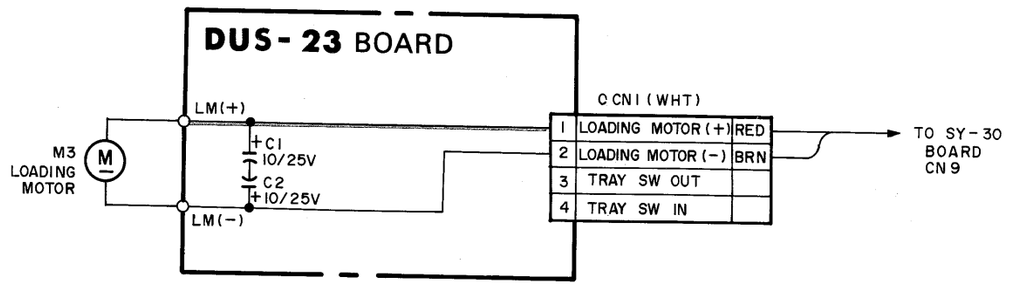




Note:

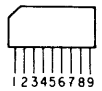
- All capacitors are in μF unless otherwise noted. pF: μμF 50V or less are not indicated except for electrolytics and tantalums.
- ▒▒ : B + bus.

When indicating parts by reference number, please include the board name.

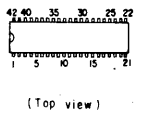


[SEMICONDUCTORS]

BA7021



CXA1018S



CXL1003P
CXL5001P
NJM2903D
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NJM4560D-D
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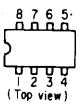

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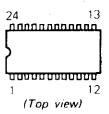
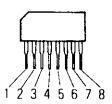


CX20061



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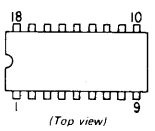

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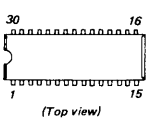

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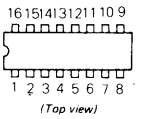

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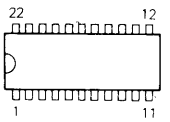

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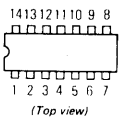
TC40H008P
TC74HC86P



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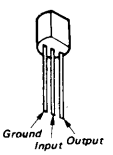

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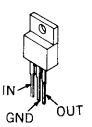
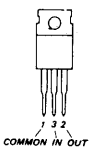


TA7060AP

μPC7905H



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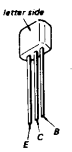
2SC403SP-3
2SC634SP

2SA1175



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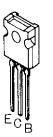
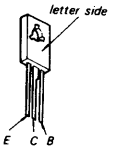
2SA1358
2SB1142-S
2SC3421-0



2SB740

2SC2690A



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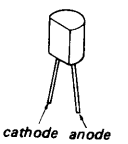
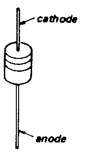
2SD773

2SK184

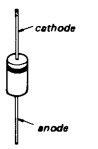
FC52M-5



RD10ESB1
RD5.1ESB1
1SS119



RD5.6ESB2
RD5.6ESB3
10E2



[EXPLODED VIEWS]

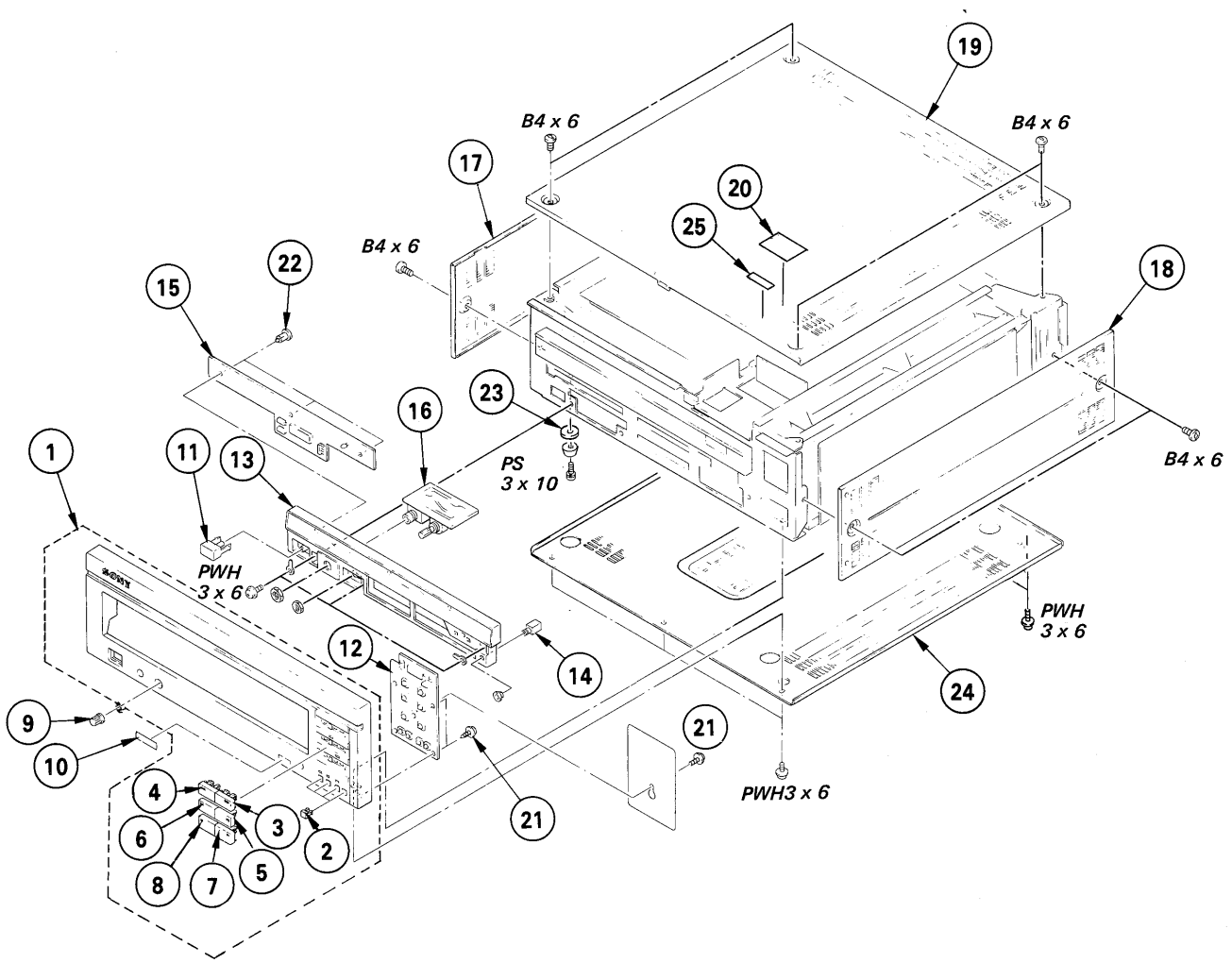
NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX, -X mean standardized parts, so they may have some differences from the original one.

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

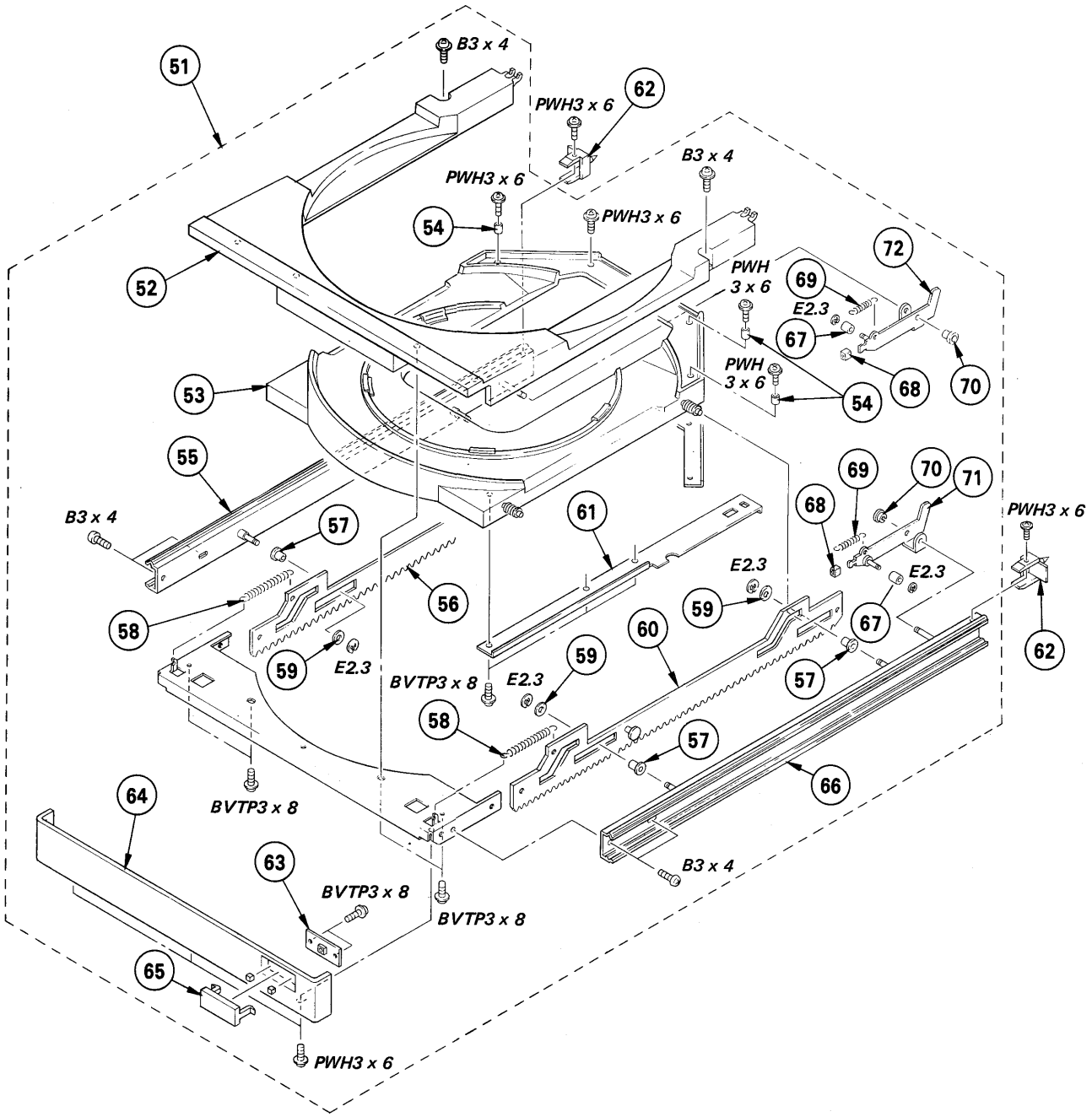
Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

(1) ORNAMENTAL PANEL



No.	Part No.	Description	Remark
1	A-6408-030-B	PANEL ASSY, FRONT	2-8
2	3-688-288-01	BUTTON, AU	
3	3-688-289-01	KEY TOP (S) (▶▶)	
4	3-688-289-11	KEY TOP (S) (◀◀)	
5	3-688-289-21	KEY TOP (S) (II ▶)	
6	3-688-289-31	KEY TOP (S) (◀ II)	
7	3-688-290-01	KEY TOP (L) (▶)	
8	3-688-290-11	KEY TOP (L) (■)	
9	4-902-067-11	KNOB, CONTROL	
10	*3-688-304-01	LABEL, MODEL NAME	
11	3-688-293-01	BUTTON, POWER	
12	*A-6421-047-A	KY-69 BOARD, COMPLETE	
13	*3-688-294-02	HOLDER, INDICATOR	
14	1-507-195-21	SPECIAL REMOTE CONTROL JACK (J2)	
15	*A-6421-034-A	LE-23 BOARD, COMPLETE	
16	*1-614-071-12	HP-18 BOARD	
17	*X-3688-251-1	PANEL ASSY (LEFT), SIDE	
18	*X-3688-252-1	PANEL ASSY (RIGHT), SIDE	
19	*3-698-656-01	PANEL, UPPER	
20	*4-604-106-11	LABEL, CAUTION	
21	4-303-483-00	HEAD, WASHER, TAPPING SCREW	
22	3-646-090-11	RIVET, NYLON	
23	*3-698-653-01	SPACER, FOOT	
24	*X-3688-253-1	PLATE ASSY, BOTTOM	
25	*3-667-648-00	LABEL, CAUTION, LASER	

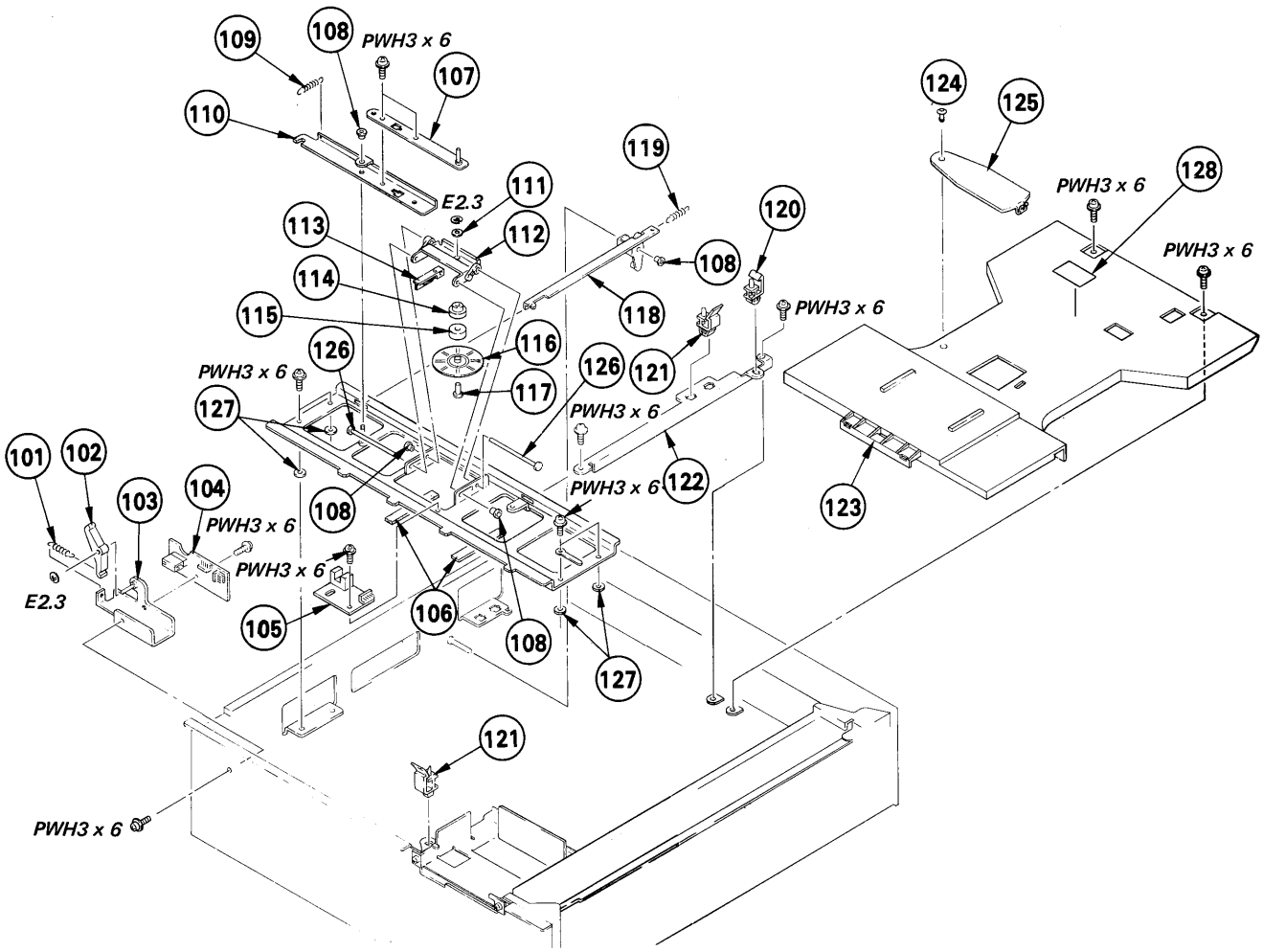
(2) FRONT LOADING ASSEMBLY



No.	Part No.	Description	Remark
51	A-6415-053-C	F.L. ASSY	52-61, 63-72
52	*3-688-213-01	COVER, TOP	
53	*X-3688-206-7	TRAY ASY	
54	*3-654-058-00	SPACER 3X3	
55	*X-3688-204-1	RAIL (LEFT) ASSY, GUIDE	
56	*3-688-210-01	RACK	
57	3-688-208-02	ROLLER (R1)	
58	3-642-429-11	SPRING, TENSION	
59	3-688-209-01	ROLLER (R2)	
60	*X-3688-207-1	RACK ASSY	
61	*3-688-217-02	HOLDER, HARNESS	

No.	Part No.	Description	Remark
62	3-688-203-03	STOPPER	
63	*1-614-066-11	DU-75 BOARD	
64	*3-688-214-01	COVER, FRONT	
65	3-688-215-01	BUTTON, FL (OPEN/CLOSE)	
66	*X-3688-202-2	RAIL (RIGHT) ASSY, GUIDE	
67	3-688-207-01	ROLLER, STOPPER	
68	*3-676-143-00	STOPPER, ARM	
69	3-535-558-00	SPRING, TENSION	
70	3-703-074-00	CAP 3, SHAFT	
71	*X-3688-203-2	ARM (RIGHT) ASSY, LOCK	
72	*X-3688-205-1	ARM (LEFT) ASSY, LOCK	

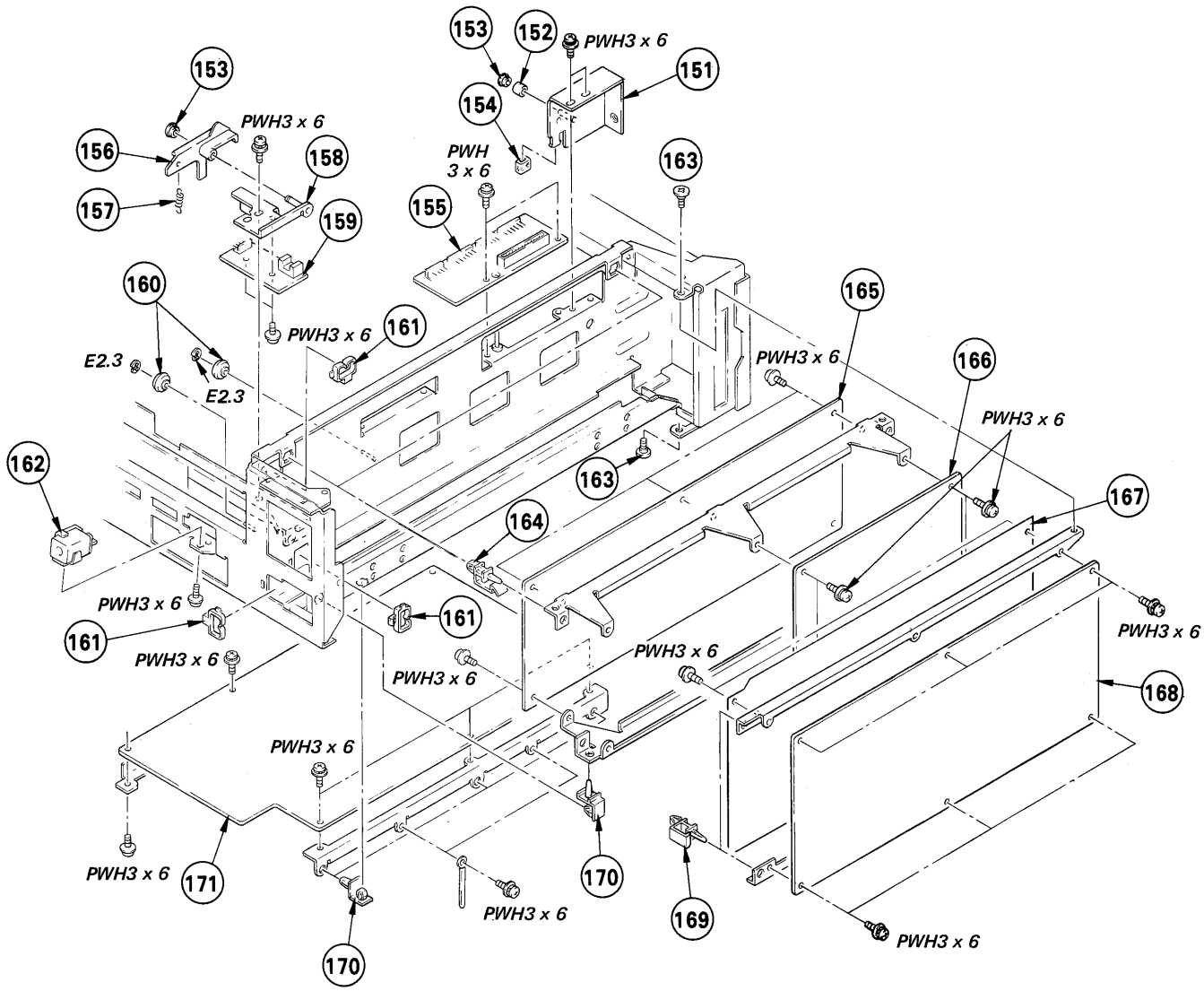
(3) CHUCK ASSEMBLY



No.	Part No.	Description	Remark
101	3-669-980-00	SPRING, TENSION	
102	*3-688-307-01	LEVER, S	
103	*X-3688-224-1	BASE ASSY, S	
104	*1-614-060-11	DUS-27 BOARD	
105	*1-614-067-14	DU-82 BOARD	
106	*3-688-228-01	CUSHION	
107	*X-3688-210-3	PLATE ASSY, ADJUSTMENT	
108	3-703-074-00	CAP 3, SHAFT	
109	3-639-381-XX	SPRING, TENSION	
110	*3-688-233-01	LINK (3)	
111	3-701-439-21	WASHER	
112	*X-3688-208-2	HOLDER ASSY, C	
113	*3-688-234-03	JOINT	
114	*3-688-229-02	HOLDER, B	

No.	Part No.	Description	Remark
115	3-694-820-01	BEARING (NO FLANGE), BALL	
116	3-688-232-01	CHUCK	
117	*3-688-230-01	PIN, CENTOR	
118	*X-3688-201-3	ARM ASSY, C	
119	3-140-194-XX	SPRING, TENSION	
120	*3-680-721-00	HOLDER, CHASSIS	
121	*3-703-141-00	HOLDER, PCB	
122	*3-688-296-01	HOLDER, OPTION	
123	*3-688-308-03	COVER, LASER	
124	3-646-090-11	RIVET, NYLON	
125	*3-688-388-01	CAP, LASER COVER	
126	*3-694-818-01	JOINT	
127	*4-909-088-01	SPACER (S)	
128	2-390-114-00	LABEL, CAUTION, BARRIER	

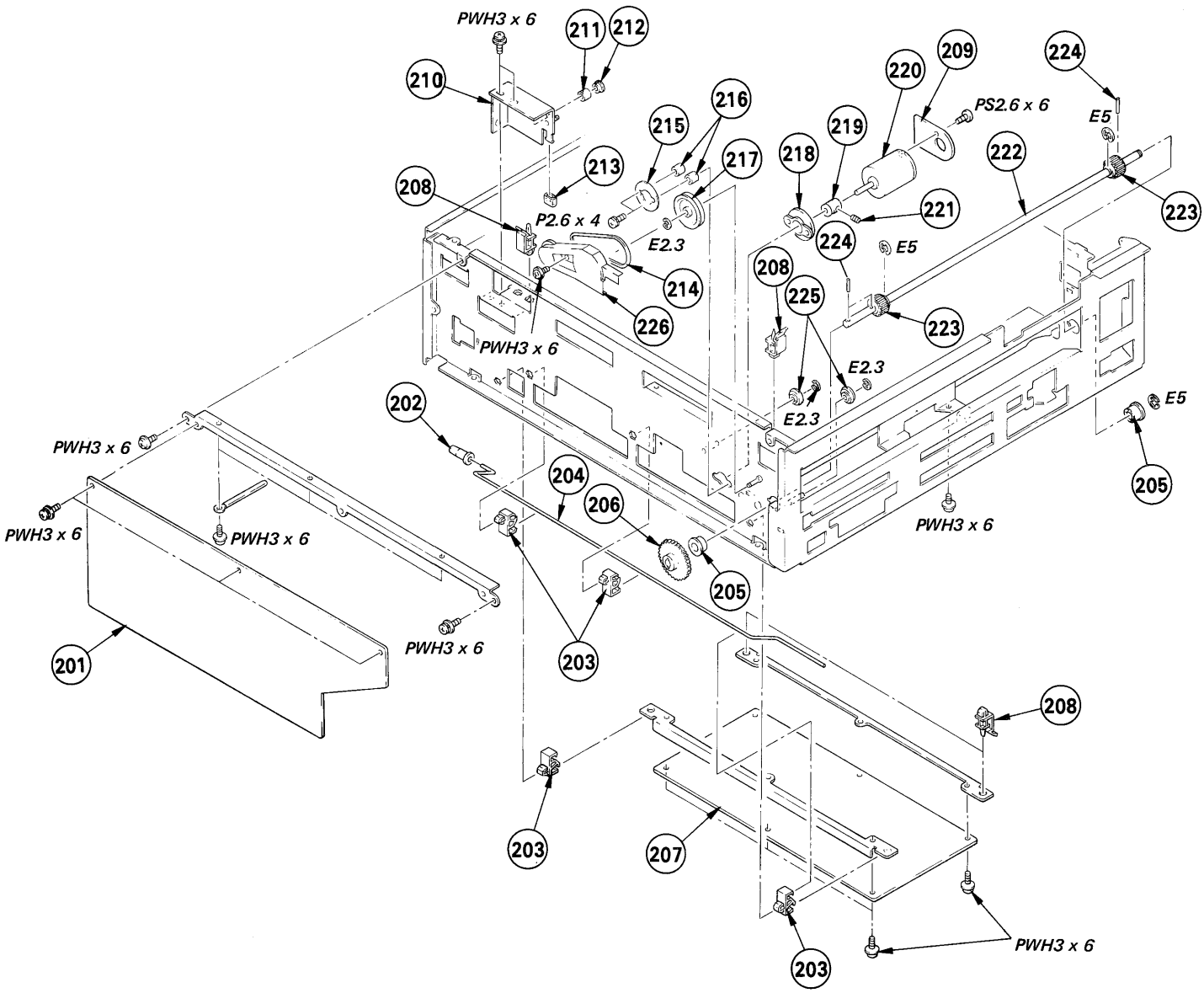
(4) CHASSIS (1)



No.	Part No.	Description	Remark
151	*X-3688-212-1	STOPPER (RIGHT) ASSY	
152	3-688-207-01	ROLLER, STOPPER	
153	3-703-074-00	CAP 3, SHAFT	
154	3-483-026-00	RETAINER, THRUST, MOTOR	
155	*1-614-072-11	DUS-28 BOARD	
156	*3-688-244-02	SHUTTER	
157	3-535-558-00	SPRING, TENSION	
158	*X-3688-211-2	HOLDER ASSY, SWITCH	
159	*1-614-085-11	DU-74 BOARD	
160	3-688-256-01	ROLLER (A), GUIDE	
161	4-310-385-00	HOLDER, WIRE	

No.	Part No.	Description	Remark
162	1-464-437-12	RECEIVER, REMOTE CONTROL (REMOTE SENSOR)	
163	2-236-956-00	SCREW, STEP	
164	*3-703-141-00	HOLDER, PCB	
165	*A-6421-042-A	SV-65 BOARD COMPLETE	
166	*A-6421-168-A	SV-26 BOARD, COMPLETE	
167	*3-688-381-02	SEALD, SV-26	
168	*A-6421-169-A	DM-14 BOARD, COMPLETE	
169	*3-680-721-00	HOLDER, CHASSIS	
170	*3-683-742-01	HINGE	
171	*A-6421-040-B	SY-30 BOARD, COMPLETE	

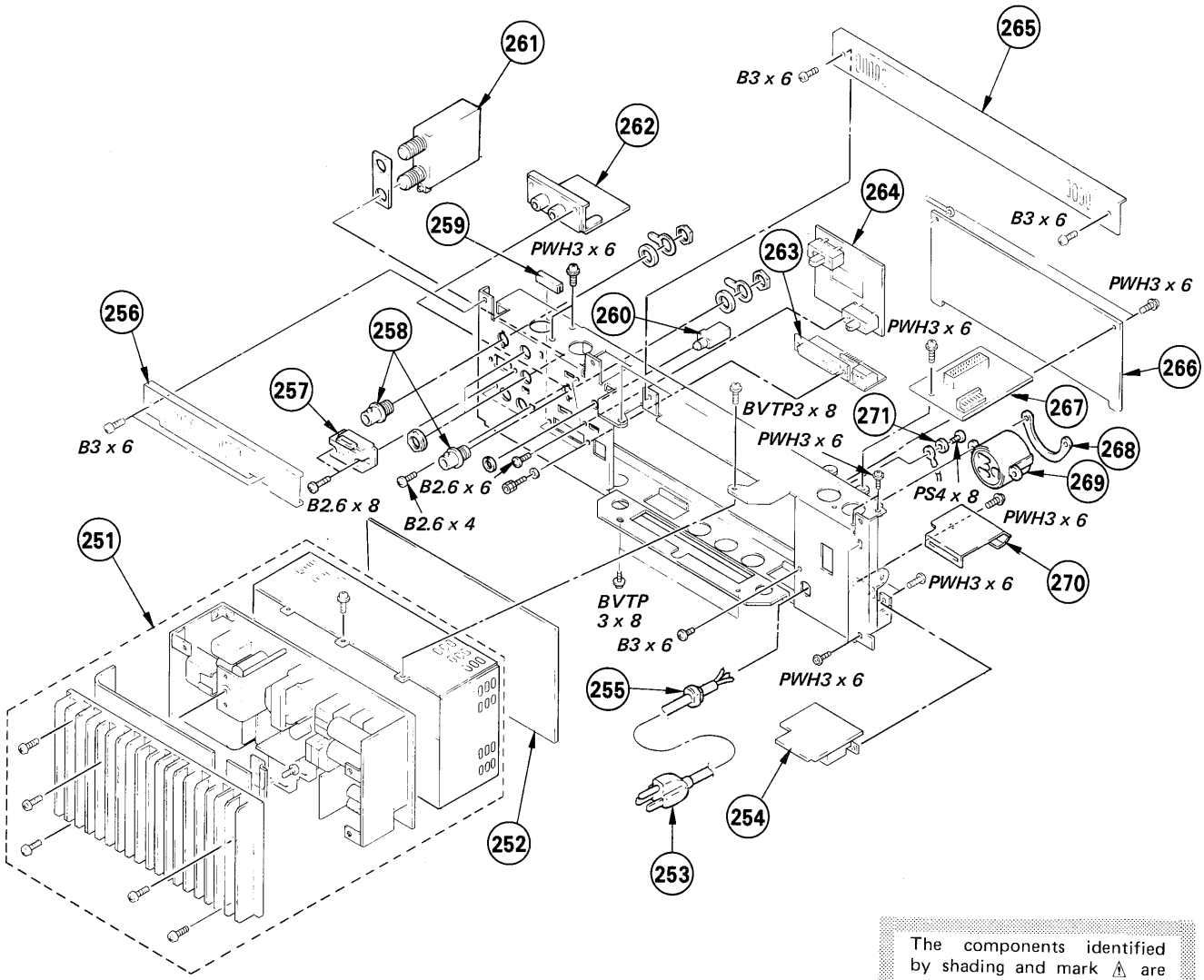
(5) CHASSIS (2)



No.	Part No.	Description	Remark
201	*A-6421-036-A	SV-59 BOARD, COMPLETE	
202	*3-688-205-01	HOLDER, W	
203	*3-674-805-00	HOLDER, PC BOARD	
204	3-688-206-02	WIRE, SWITCH	
205	3-642-595-03	BEARING (6)	
206	3-688-202-01	GEAR, DRIVE	
207	*A-6421-167-A	AU-33 BOARD, COMPLETE	
208	*3-703-141-00	HOLDER, PCB	
209	*1-614-057-13	DUS-23 BOARD	
210	*X-3688-213-1	STOPPER (LEFT) ASSY	
211	3-688-207-01	ROLLER, STOPPER	
212	3-703-074-00	CAP 3, SHAFT	
213	3-483-026-00	RETAINER, THRUST, MOTOR	

No.	Part No.	Description	Remark
214	3-534-779-00	BELT, DRIVE	
215	*3-688-204-01	WASHER, M	
216	3-307-259-11	SPACER (2.6X3.5)	
217	3-688-201-01	PULLEY, G	
218	*3-688-257-01	DAMPER	
219	3-668-302-00	PULLEY, MOTOR	
220	1-541-376-11	MOTOR (LOADING) (M3)	
221	3-701-506-01	SET SCREW, DOUBLE POINT 3X4	
222	3-688-247-01	SHAFT, DRIVE	
223	3-688-246-02	GEAR, PINION	
224	3-703-358-03	PIN, PARALLEL (DIA. 2X8)	
225	3-688-256-01	ROLLER (A), GUIDE	
226	*3-698-601-02	COVER, GEAR	

(6) CONNECTOR PANEL



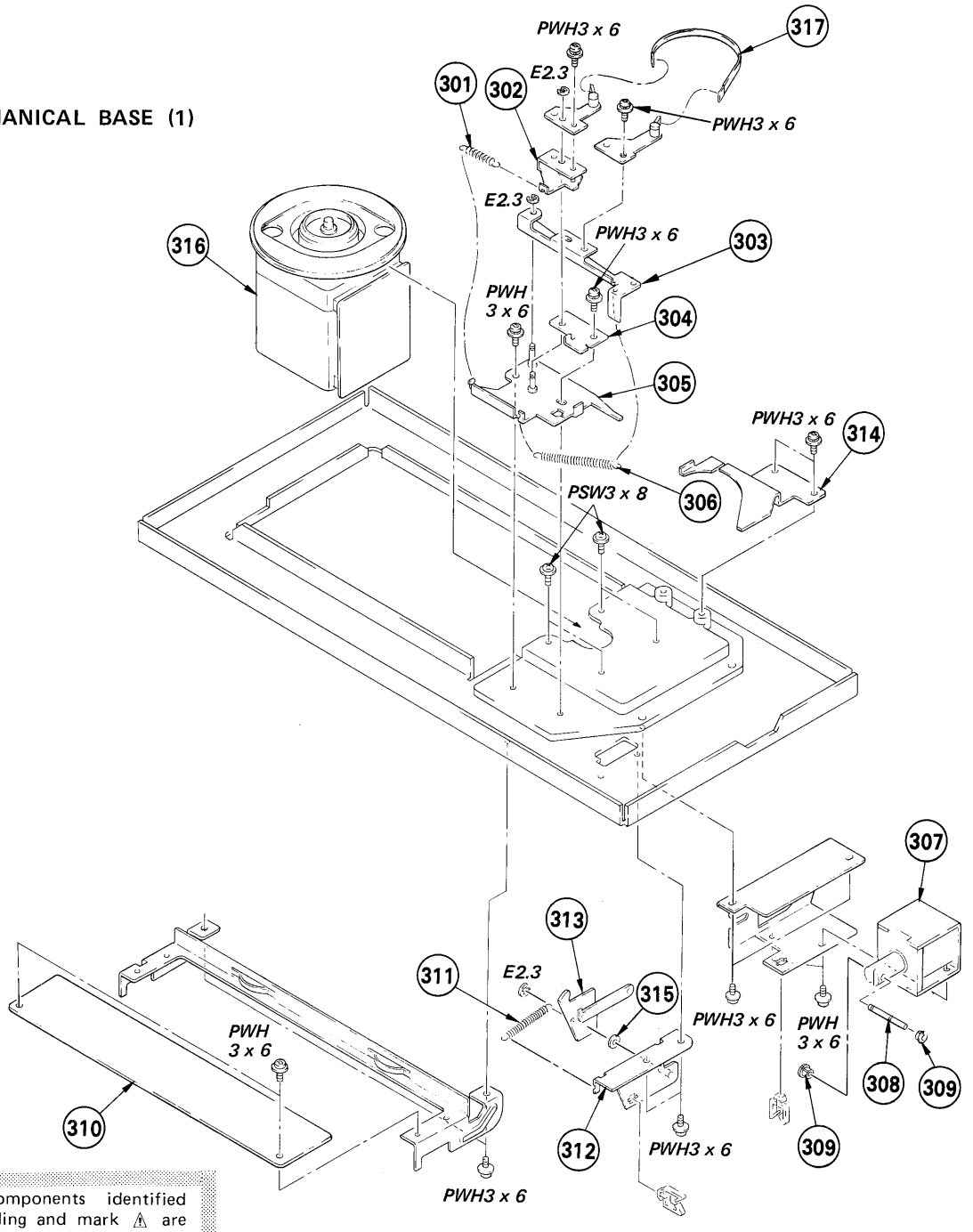
The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

No.	Part No.	Description	Remark
251	⚠1-413-185-11	SWITCHING REGULATOR (UR-12)	
252	*3-688-346-02	SHEET, INSULATING	
253	⚠1-534-517-00	CORD, AC	
254	*1-614-074-11	SW-87 BOARD	
255	⚠2-045-063-00	STOPPER, CORD	
256	3-698-646-01	PANEL (LEFT), REAR	
257	1-561-671-00	SOCKET, MULTI CONNECTOR 8P (CN2)	
258	1-561-781-11	CONNECTOR, BNC (VIDEO OUT) (CN1, 3)	
259	*4-911-234-01	EDGING	
260	1-507-195-21	SPECIAL REMOTE CONTROL JACK (J3)	
261	1-464-423-22	UNIT, COLOR RF	

No.	Part No.	Description	Remark
262	*1-614-069-11	DU-84 BOARD	
263	*1-614-056-12	DUS-13 BOARD	
264	*1-614-070-12	DUS-12 BOARD	
265	3-698-645-01	PANEL (RIGHT), REAR	
266	*A-6421-048-A	AC-49 BOARD, COMPLETE	
267	*1-614-075-12	DUS-29 BOARD	
268	*3-651-491-00	NUT, (AC), PLATE	
269	⚠1-509-841-00	OUTLET, AC	
270	3-688-340-01	COVER, AC	
271	*3-645-076-00	WASHER, M-REEL S	

(7) MECHANICAL BASE (1)



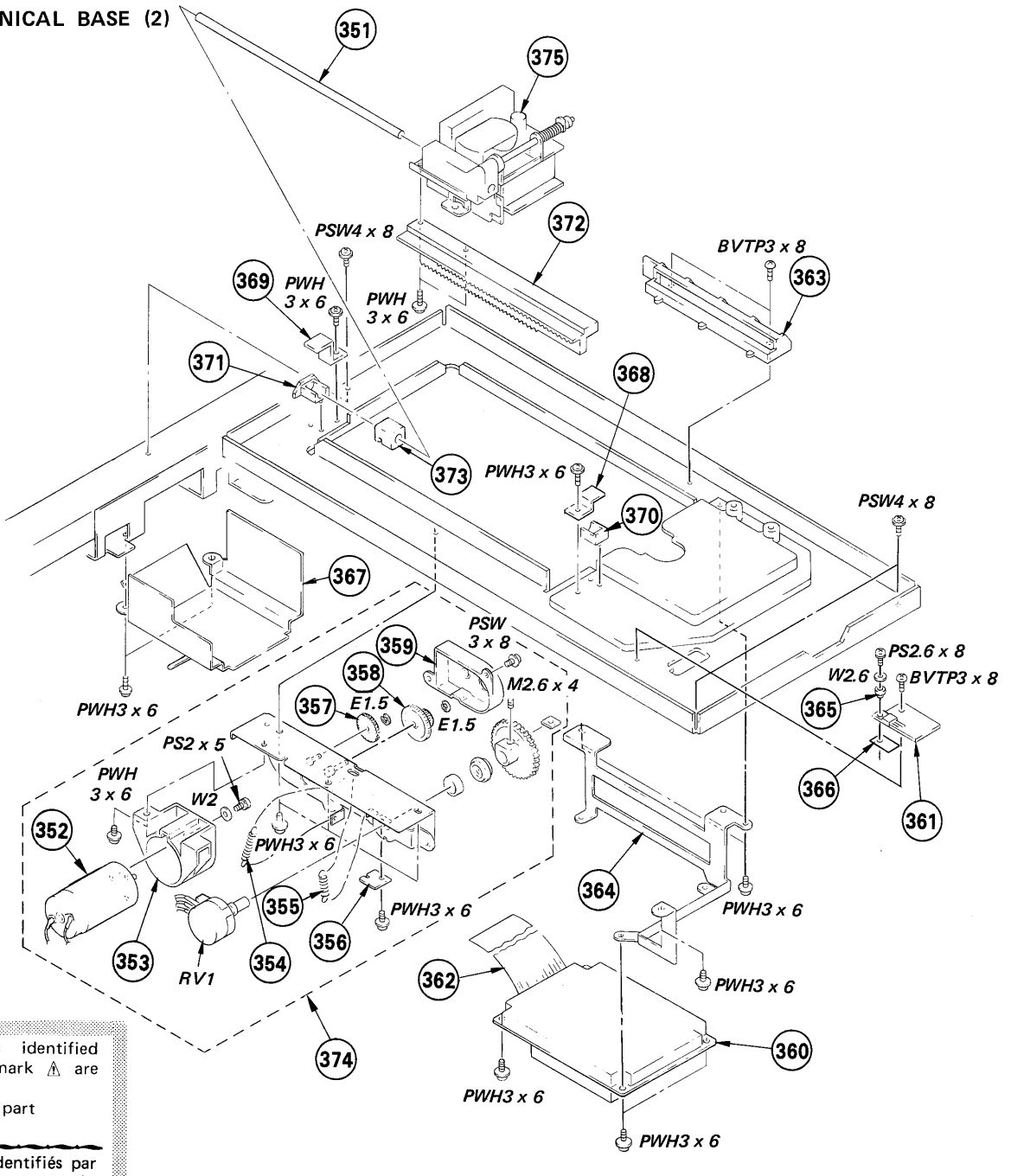
The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

No.	Part No.	Description	Remark
301	3-483-119-00	SPRING, TENSION	
302	*3-688-368-01	LIMITER, BRAKE	
303	*3-688-262-03	ARM, BRAKE	
304	*3-688-369-01	STOPPER, LIMITER	
305	*X-3688-236-1	BASE ASSY	
306	3-630-622-00	SPRING	
307	⚠1-454-274-22	SOLENOID, PLUNGER (BRAKE) (PM1)	
308	3-688-278-01	PIN, SOLENOID, RELEASE	
309	3-703-074-00	CAP 3, SHAFT	

No.	Part No.	Description	Remark
310	*1-614-065-12	DUS-25 BOARD	
311	3-701-788-XX	SPRING, TENSION	
312	*X-3688-245-1	PLATE ASSY, HINGE	
313	*X-3688-246-1	ARM ASSY, DRIVE	
314	*3-698-630-01	STOPPER, BRAKE BAND	
315	3-701-439-21	WASHER	
316	8-838-084-01	MOTOR, DC (BHF-1700B) (SPINDLE) (M2)	
317	X-3688-244-1	BAND ASSY, BRAKE	

(8) MECHANICAL BASE (2)



The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

No.	Part No.	Description	Remark
351	*3-688-322-02	SHAFT, GUIDE	
352	X-3705-058-1	MOTOR ASSY (SLIDE) (M1)	
353	*3-707-149-01	HOLDER, MOTOR	
354	3-143-025-00	SPRING, TENSION	
355	3-472-221-00	SPRING, TENSION	
356	*3-707-145-03	STOPPER	
357	3-707-142-01	GEAR (A)	
358	3-707-143-01	GEAR (B)	
359	*3-707-144-01	COVER	
360	*A-6421-170-A	RF-13 BOARD, COMPLETE	
361	*1-621-092-11	DUS-150 BOARD	
362	1-558-969-11	WIRE, FLEXIBLE CARD 20P	
363	*3-698-621-01	TABLE, ROLLER	
364	*3-698-622-01	BRACKET, RF	
365	2-832-007-00	BUSHING (K), INSULATING	
366	3-703-207-11	INSULATOR, TO-220	
367	*X-3688-247-1	SHIELD ASSY, FLEXIBLE	
368	*3-698-613-01	CLAMP (A)	
369	*3-698-614-01	CLAMP (B)	
370	*3-698-615-01	HOLDER (A), FEED SHAFT	
371	*3-698-623-01	HOLDER (B), FEED SHAFT	
372	3-698-641-01	RACK	
373	*3-698-660-01	STOPPER, OPT	
374	1-464-441-13	MOTOR BLOCK ASSY	352-359
375	⚠A-8-848-053-01	PICKUP, OPTICS KSS-141B	

[HARDWARE LIST]

SCREW

7-621-259-25	SCREW +P 2.6X4
7-621-259-45	SCREW +P 2.6X6
7-628-254-30	+PSW, 2.6X10
7-621-770-67	SCREW +B 2.6X6
7-621-773-86	SCREW +B 2.6X4
7-621-775-40	SCREW +B 2.6X8
7-628-253-10	SCREW +PS 2X5
7-628-254-20	SCREW +PS 2.6X8
7-682-147-01	SCREW +P 3X6
7-682-545-09	SCREW +B 3X4
7-682-547-04	SCREW +B 3X6
7-682-560-04	SCREW +B 4X6
7-682-560-09	SCREW +B 4X6
7-682-647-09	SCREW +PS 3X6
7-682-649-09	SCREW +PS 3X10
7-682-661-09	SCREW +PS 4X8
7-682-647-09	SCREW +PWH 3X6
7-682-647-09	SCREW +PSW 3X6
7-682-661-09	SCREW +PSW 4X8
7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3
7-685-646-79	SCREW +BVTP 3X8 TYPE2

SET-SCT

7-621-735-09	SET-SCT, HEX. 2.6X4

STOP RING

7-624-102-04	STOP RING 1.5, TYPE -E
7-624-105-04	STOP RING 2.3, TYPE -E
7-624-109-04	STOP RING 5.0, TYPE -E

WASHER

7-688-001-01	W 2, SMALL
7-688-002-01	W 2.6, MIDDLE
7-688-003-11	W 3, MIDDLE

AU-33

[ELECTRICAL PARTS LIST]

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- SEMICONDUCTORS
  In each case, U: μ, for example:
  UA. . . : μA. . . , UPA. . . : μPA. . . ,
  UPB. . . : μPB. . . , UPC. . . : μPC. . . ,
  UPD. . . : μPD. . .
- CAPACITORS
  MF: μF, PF: μμF
- COILS
  MMH: mH, UH: μH

Ref.No	Part No.	Description			Remark
	*A-6421-167-A	AU-33 BOARD, COMPLETE			
		**********			
		CAPACITOR			
C002	1-161-494-00	CERAMIC	0.022MF		25V
C005	1-124-245-00	ELECT	4.7MF	20%	25V
C006	1-130-495-00	MYLAR	0.1MF	5%	50V
C007	1-161-494-00	CERAMIC	0.022MF		25V
C008	1-124-446-11	ELECT	47MF	20%	10V
C009	1-161-494-00	CERAMIC	0.022MF		25V
C010	1-161-494-00	CERAMIC	0.022MF		25V
C011	1-124-462-00	ELECT	10MF	20%	16V
C012	1-161-494-00	CERAMIC	0.022MF		25V
C013	1-131-346-00	ELECT(SOLID)	0.68MF	10%	25V
C014	1-124-462-00	ELECT	10MF	20%	16V
C015	1-161-494-00	CERAMIC	0.022MF		25V
C016	1-161-375-00	CERAMIC	0.0022MF	30%	16V
C017	1-161-494-00	CERAMIC	0.022MF		25V
C018	1-161-494-00	CERAMIC	0.022MF		25V
C019	1-162-207-31	CERAMIC	22PF	5%	50V
C020	1-162-283-31	CERAMIC	120PF	10%	50V
C021	1-161-379-00	CERAMIC	0.01MF	30%	16V
C022	1-124-444-00	ELECT	220MF	20%	10V
C023	1-162-280-31	CERAMIC	82PF	10%	50V
C024	1-161-374-11	CERAMIC	0.0015MF	30%	16V
C025	1-162-283-31	CERAMIC	120PF	10%	50V
C027	1-130-473-00	MYLAR	0.0015MF	5%	50V
C028	1-130-473-00	MYLAR	0.0015MF	5%	50V
C029	1-130-481-00	MYLAR	0.0068MF	5%	50V
C030	1-124-234-00	ELECT	22MF	20%	16V
C031	1-124-245-00	ELECT	4.7MF	20%	25V
C032	1-130-479-00	MYLAR	0.0047MF	5%	50V
C034	1-124-444-00	ELECT	220MF	20%	10V
C035	1-162-286-31	CERAMIC	220PF	10%	50V
C036	1-161-494-00	CERAMIC	0.022MF		25V
C037	1-161-375-00	CERAMIC	0.0022MF	30%	16V
C039	1-161-494-00	CERAMIC	0.022MF		25V
C040	1-162-209-31	CERAMIC	27PF	5%	50V
C041	1-162-283-31	CERAMIC	120PF	10%	50V
C042	1-161-379-00	CERAMIC	0.01MF	30%	16V
C043	1-124-444-00	ELECT	220MF	20%	10V
C044	1-162-217-31	CERAMIC	56PF	5%	50V
C045	1-161-374-11	CERAMIC	0.0015MF	30%	16V
C046	1-162-283-31	CERAMIC	120PF	10%	50V
C048	1-130-473-00	MYLAR	0.0015MF	5%	50V
C049	1-130-473-00	MYLAR	0.0015MF	5%	50V
C050	1-130-481-00	MYLAR	0.0068MF	5%	50V
C051	1-123-622-00	ELECT	22MF	20%	16V
C052	1-130-479-00	MYLAR	0.0047MF	5%	50V
C054	1-162-286-31	CERAMIC	220PF	10%	50V
C055	1-124-444-00	ELECT	220MF	20%	10V
C056	1-130-489-00	MYLAR	0.033MF	5%	50V
C057	1-130-489-00	MYLAR	0.033MF	5%	50V

Ref.No	Part No.	Description			Remark
C058	1-124-283-00	ELECT	4.7MF	20%	16V
C059	1-124-283-00	ELECT	4.7MF	20%	16V
C060	1-130-493-00	MYLAR	0.068MF	5%	50V
C061	1-130-493-00	MYLAR	0.068MF	5%	50V
C062	1-124-446-11	ELECT	47MF	20%	10V
C063	1-124-446-11	ELECT	47MF	20%	10V
C064	1-124-902-00	ELECT	0.47MF	20%	50V
C065	1-124-234-00	ELECT	22MF	20%	16V
C066	1-124-245-00	ELECT	4.7MF	20%	25V
C067	1-130-495-00	MYLAR	0.1MF	5%	50V
C068	1-124-245-00	ELECT	4.7MF	20%	25V
C069	1-124-245-00	ELECT	4.7MF	20%	25V
C070	1-162-199-31	CERAMIC	10PF	5%	50V
C071	1-162-199-31	CERAMIC	10PF	5%	50V
C072	1-124-282-00	ELECT	22MF	20%	16V
C073	1-124-282-00	ELECT	22MF	20%	16V
C074	1-123-875-11	ELECT	10MF	20%	50V
C075	1-124-477-11	ELECT	47MF	20%	25V
C082	1-124-925-11	ELECT	2.2MF	20%	50V
C083	1-162-219-31	CERAMIC	68PF	5%	50V
C084	1-124-499-11	ELECT	1MF	20%	50V
C085	1-124-925-11	ELECT	2.2MF	20%	50V
C086	1-124-234-00	ELECT	22MF	20%	16V
C087	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C088	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C090	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C091	1-162-283-31	CERAMIC	120PF	10%	50V
C092	1-161-021-11	CERAMIC	0.047MF	10%	25V
C101	1-124-499-11	ELECT	1MF	20%	50V
C102	1-124-499-11	ELECT	1MF	20%	50V
C103	1-124-499-11	ELECT	1MF	20%	50V
C104	1-126-103-11	ELECT	470MF	20%	16V
C105	1-126-103-11	ELECT	470MF	20%	16V
C106	1-161-021-11	CERAMIC	0.047MF	10%	25V
C107	1-161-021-11	CERAMIC	0.047MF	10%	25V
C108	1-124-477-11	ELECT	47MF	20%	16V
C109	1-126-103-11	ELECT	470MF	20%	16V
C110	1-126-103-11	ELECT	470MF	20%	16V
C111	1-126-103-11	ELECT	470MF	20%	16V
C121	1-124-290-00	ELECT	47MF	20%	10V
C122	1-124-290-00	ELECT	47MF	20%	10V
C123	1-130-483-00	MYLAR	0.01MF	5%	50V
C124	1-130-483-00	MYLAR	0.01MF	5%	50V
C125	1-162-215-31	CERAMIC	47PF	5%	50V
C126	1-162-215-31	CERAMIC	47PF	5%	50V
C151	1-161-379-00	CERAMIC	0.01MF	30%	16V
C152	1-101-004-00	CERAMIC	0.01MF		50V
C201	1-162-219-31	CERAMIC	68PF	5%	50V
C202	1-162-219-31	CERAMIC	68PF	5%	50V
C204	1-161-494-00	CERAMIC	0.022MF		25V
C207	1-162-290-31	CERAMIC	470PF	10%	50V

Ref.No	Part No.	Description	Remark
		CONNECTOR	
CN001	*1-564-003-00	PIN, CONNECTOR 4P	
CN002	*1-564-011-11	PIN, CONNECTOR 12P	
CN003	*1-564-005-00	PIN, CONNECTOR 6P	
CN004	*1-564-005-00	PIN, CONNECTOR 6P	
CN005	*1-564-002-00	PIN, CONNECTOR 3P	
CN006	*1-564-007-00	PIN, CONNECTOR 8P	
CN007	*1-564-002-00	PIN, CONNECTOR 3P	
		DIODE	
D001	8-719-911-19	DIODE 1SS119	
D002	8-719-911-19	DIODE 1SS119	
D003	8-719-911-19	DIODE 1SS119	
D004	8-719-911-19	DIODE 1SS119	
D005	8-719-100-35	ZENER DIODE RD5.6EB2	
D006	8-719-911-19	DIODE 1SS119	
D007	8-719-200-02	DIODE 10E-2	
		FILTER	
FL001	1-235-591-11	FILTER, BAND PASS (684KHz)	
FL002	1-235-824-11	FILTER, BAND PASS (1MHz)	
		IC	
IC001	8-752-320-30	IC CXL1003P	
IC002	8-759-705-58	IC NJM4558D-D	
IC003	8-759-303-75	IC HA12083NT	
IC004	8-759-302-81	IC HA12043	
IC005	8-759-745-61	IC NJM4560D-D	
IC006	8-759-745-61	IC NJM4560D-D	
IC007	8-759-240-52	IC TC4052BP	
IC008	8-759-990-82	IC TL082CP	
IC009	8-759-729-01	IC NJM2901N	
IC010	⚠ 8-759-700-11	IC NJM78M05A	
IC011	⚠ 8-759-700-65	IC NJM79L05A	
IC012	8-759-705-58	IC NJM4558D-D	
		COIL	
L001	1-410-517-41	INDUCTOR 47UH	
L002	1-410-515-41	INDUCTOR 33UH	
L005	1-408-922-00	INDUCTOR 6.8MMH	
L008	1-408-922-00	INDUCTOR 6.8MMH	
L010	1-410-119-11	INDUCTOR 1MMH	
L011	1-410-119-11	INDUCTOR 1MMH	
L012	1-408-920-00	INDUCTOR 4.7MMH	
L013	1-408-920-00	INDUCTOR 4.7MMH	
L014	1-410-520-41	INDUCTOR 82UH	
		TRANSISTOR	
Q001	8-729-600-27	TRANSISTOR 2SC634SP	
Q002	8-729-117-54	TRANSISTOR 2SA1175	
Q003	8-729-600-27	TRANSISTOR 2SC634SP	
Q004	8-729-600-27	TRANSISTOR 2SC634SP	
Q005	8-729-600-27	TRANSISTOR 2SC634SP	
Q006	8-729-600-27	TRANSISTOR 2SC634SP	
Q007	8-729-177-32	TRANSISTOR 2SD773	
Q008	8-729-207-81	TRANSISTOR 2SC3421-0	
Q009	8-729-207-88	TRANSISTOR 2SA1358	
Q010	8-729-201-04	TRANSISTOR 2SC2878	
Q011	8-729-201-04	TRANSISTOR 2SC2878	
Q012	8-729-117-54	TRANSISTOR 2SA1175	
		RESISTOR	
R001	1-249-417-11	CARBON 1K 5% 1/4W	
R004	1-249-421-11	CARBON 2.2K 5% 1/4W	
R005	1-249-441-11	CARBON 100K 5% 1/4W	
R006	1-249-417-11	CARBON 1K 5% 1/4W	
R007	1-249-425-11	CARBON 4.7K 5% 1/4W	
R008	1-249-420-11	CARBON 1.8K 5% 1/4W	
R009	1-249-408-11	CARBON 180 5% 1/4W	
R010	1-249-413-11	CARBON 470 5% 1/4W	
R011	1-247-895-00	CARBON 470K 5% 1/4W	
R012	1-249-437-11	CARBON 47K 5% 1/4W	
R013	1-249-437-11	CARBON 47K 5% 1/4W	
R014	1-249-437-11	CARBON 47K 5% 1/4W	
R015	1-249-425-11	CARBON 4.7K 5% 1/4W	
R016	1-249-441-11	CARBON 100K 5% 1/4W	
R017	1-249-437-11	CARBON 47K 5% 1/4W	
R018	1-249-416-11	CARBON 820 5% 1/4W	
R019	1-249-417-11	CARBON 1K 5% 1/4W	
R020	1-249-417-11	CARBON 1K 5% 1/4W	
R021	1-215-438-00	CARBON 5.1K 5% 1/4W	
R022	1-249-428-11	CARBON 8.2K 5% 1/4W	
R023	1-249-423-11	CARBON 3.3K 5% 1/4W	
R024	1-215-398-00	METAL 110 1% 1/6W	
R025	1-215-437-00	METAL 4.7K 1% 1/6W	
R026	1-249-419-11	CARBON 1.5K 5% 1/4W	
R027	1-249-413-11	CARBON 470 5% 1/4W	
R028	1-249-418-11	CARBON 1.2K 5% 1/4W	
R029	1-249-749-00	CARBON 2.2M 5% 1/4W	
R030	1-249-421-11	CARBON 2.2K 5% 1/4W	
R031	1-249-441-11	CARBON 100K 5% 1/4W	
R032	1-249-441-11	CARBON 100K 5% 1/4W	
R035	1-249-416-11	CARBON 820 5% 1/4W	
R036	1-249-417-11	CARBON 1K 5% 1/4W	
R037	1-249-417-11	CARBON 1K 5% 1/4W	
R038	1-215-438-00	CARBON 5.1K 5% 1/4W	
R039	1-249-431-11	CARBON 15K 5% 1/4W	
R040	1-249-425-11	CARBON 4.7K 5% 1/4W	
R041	1-249-423-11	CARBON 3.3K 5% 1/4W	
R042	1-249-419-11	CARBON 1.5K 5% 1/4W	
R043	1-249-413-11	CARBON 470 5% 1/4W	
R044	1-249-418-11	CARBON 1.2K 5% 1/4W	
R045	1-249-749-00	CARBON 2.2M 5% 1/4W	
R046	1-249-421-11	CARBON 2.2K 5% 1/4W	
R047	1-249-441-11	CARBON 100K 5% 1/4W	

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Ref.No	Part No.	Description				Remark
R048	1-249-441-11	CARBON	100K	5%	1/4W	
R051	1-249-424-11	CARBON	3.9K	5%	1/4W	
R052	1-249-424-11	CARBON	3.9K	5%	1/4W	
R053	1-215-438-00	CARBON	5.1K	5%	1/4W	
R054	1-215-438-00	CARBON	5.1K	5%	1/4W	
R055	1-249-425-11	CARBON	4.7K	5%	1/4W	
R056	1-249-425-11	CARBON	4.7K	5%	1/4W	
R057	1-249-753-15	CARBON	4.7M	5%	1/4W	
R058	1-249-441-11	CARBON	100K	5%	1/4W	
R059	1-247-883-00	CARBON	150K	5%	1/4W	
R060	1-247-883-00	CARBON	150K	5%	1/4W	
R061	1-249-441-11	CARBON	100K	5%	1/4W	
R062	1-249-440-11	CARBON	82K	5%	1/4W	
R063	1-249-440-11	CARBON	82K	5%	1/4W	
R064	1-247-881-00	CARBON	120K	5%	1/4W	
R065	1-247-881-00	CARBON	120K	5%	1/4W	
R066	1-247-887-00	CARBON	220K	5%	1/4W	
R067	1-247-887-00	CARBON	220K	5%	1/4W	
R068	1-249-409-11	CARBON	220	5%	1/4W	
R069	1-249-409-11	CARBON	220	5%	1/4W	
R070	1-249-429-11	CARBON	10K	5%	1/4W	
R071	1-249-429-11	CARBON	10K	5%	1/4W	
R072	1-249-429-11	CARBON	10K	5%	1/4W	
R073	1-249-429-11	CARBON	10K	5%	1/4W	
R074	1-249-441-11	CARBON	100K	5%	1/4W	
R075	1-249-441-11	CARBON	100K	5%	1/4W	
R076	1-249-417-11	CARBON	1K	5%	1/4W	
R077	1-249-417-11	CARBON	1K	5%	1/4W	
R078	1-249-437-11	CARBON	47K	5%	1/4W	
R079	1-249-437-11	CARBON	47K	5%	1/4W	
R080	1-249-441-11	CARBON	100K	5%	1/4W	
R085	1-249-438-11	CARBON	56K	5%	1/4W	
R086	1-249-429-11	CARBON	10K	5%	1/4W	
R087	1-249-429-11	CARBON	10K	5%	1/4W	
R088	1-215-493-00	CARBON	1M	5%	1/4W	
R089	1-249-429-11	CARBON	10K	5%	1/4W	
R090	1-249-429-11	CARBON	10K	5%	1/4W	
R091	1-247-895-00	CARBON	470K	5%	1/4W	
R092	1-249-429-11	CARBON	10K	5%	1/4W	
R093	1-249-429-11	CARBON	10K	5%	1/4W	
R094	1-249-437-11	CARBON	47K	5%	1/4W	
R095	1-249-426-11	CARBON	5.6K	5%	1/4W	
R096	1-249-426-11	CARBON	5.6K	5%	1/4W	
R097	1-249-441-11	CARBON	100K	5%	1/4W	
R099	1-249-437-11	CARBON	47K	5%	1/4W	
R101	1-249-412-11	CARBON	390	5%	1/4W	
R102	1-249-419-11	CARBON	1.5K	5%	1/4W	
R104	1-249-412-11	CARBON	390	5%	1/4W	
R105	1-249-413-11	CARBON	470	5%	1/4W	
R107	1-249-413-11	CARBON	470	5%	1/4W	
R108	1-249-412-11	CARBON	390	5%	1/4W	
R123	1-249-417-11	CARBON	1K	5%	1/4W	
R124	1-249-417-11	CARBON	1K	5%	1/4W	

Ref.No	Part No.	Description				Remark
R125	1-249-412-11	CARBON	390	5%	1/4W	
R126	1-249-412-11	CARBON	390	5%	1/4W	
R127	1-249-435-11	CARBON	33K	5%	1/4W	
R128	1-249-435-11	CARBON	33K	5%	1/4W	
R129	1-249-437-11	CARBON	47K	5%	1/4W	
R130	1-249-437-11	CARBON	47K	5%	1/4W	
R131	1-249-417-11	CARBON	1K	5%	1/4W	
R132	1-249-417-11	CARBON	1K	5%	1/4W	
R133	1-249-417-11	CARBON	1K	5%	1/4W	
R134	1-249-417-11	CARBON	1K	5%	1/4W	
R135	1-249-411-11	CARBON	330	5%	1/4W	
R136	1-249-441-11	CARBON	100K	5%	1/4W	
R141	1-249-429-11	CARBON	10K	5%	1/4W	
R143	1-249-429-11	CARBON	10K	5%	1/4W	
R144	1-249-417-11	CARBON	1K	5%	1/4W	
R145	1-249-429-11	CARBON	10K	5%	1/4W	
R146	1-249-429-11	CARBON	10K	5%	1/4W	
R147	1-249-423-11	CARBON	3.3K	5%	1/4W	
R152	1-215-388-00	CARBON	43	5%	1/4W	
R203	1-249-417-11	CARBON	1K	5%	1/4W	
R204	1-249-413-11	CARBON	470	5%	1/4W	
R205	1-249-429-11	CARBON	10K	5%	1/4W	

VARIABLE RESISTOR

RV001	1-228-993-00	RES, ADJ, CARBON 4.7K	
RV002	1-228-996-00	RES, ADJ, CARBON 47K	
RV003	1-228-995-00	RES, ADJ, CARBON 22K	
RV004	1-228-995-00	RES, ADJ, CARBON 22K	

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*A-6421-168-A SV-26 BOARD, COMPLETE

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CAPACITOR

C501	1-123-611-00	ELECT	1MF	20%	50V
C502	1-126-101-11	ELECT	100MF	20%	16V
C503	1-124-236-00	ELECT	47MF	20%	16V
C504	1-162-204-31	CERAMIC	16PF	5%	50V
C505	1-126-101-11	ELECT	100MF	20%	16V
C506	1-124-236-00	ELECT	47MF	20%	16V
C507	1-124-236-00	ELECT	47MF	20%	16V
C508	1-124-462-00	ELECT	10MF	20%	16V
C509	1-124-120-11	ELECT	220MF	20%	16V
C510	1-124-120-11	ELECT	220MF	20%	16V
C511	1-124-477-11	ELECT	47MF	20%	25V
C512	1-161-055-00	CERAMIC	0.022MF	10%	25V
C513	1-124-236-00	ELECT	47MF	20%	16V
C514	1-161-055-00	CERAMIC	0.022MF	10%	25V
C515	1-124-236-00	ELECT	47MF	20%	16V
C516	1-161-055-00	CERAMIC	0.022MF	10%	25V
C517	1-124-119-00	ELECT	330MF	20%	16V
C518	1-124-119-00	ELECT	330MF	20%	16V
C519	1-162-291-31	CERAMIC	560PF	10%	50V

Ref.No	Part No.	Description				Remark
C520	1-126-101-11	ELECT	100MF	20%	16V	
C550	1-162-283-31	CERAMIC	120PF	10%	50V	
C551	1-161-055-00	CERAMIC	0.022MF	10%	25V	
C552	1-124-245-00	ELECT	4.7MF	20%	25V	
C553	1-162-207-31	CERAMIC	22PF	5%	50V	
C554	1-161-043-00	CERAMIC	0.0022MF	10%	25V	
C555	1-124-236-00	ELECT	47MF	20%	16V	
C556	1-107-208-00	MICA	18PF	5%	500V	
C557	1-107-157-00	MICA	27PF	5%	500V	
C558	1-123-611-00	ELECT	1MF	20%	50V	
C559	1-124-236-00	ELECT	47MF	20%	16V	
C560	1-124-236-00	ELECT	47MF	20%	16V	
C563	1-123-611-00	ELECT	1MF	20%	50V	
C564	1-123-611-00	ELECT	1MF	20%	50V	
C565	1-130-483-00	MYLAR	0.01MF	5%	50V	
C566	1-130-479-00	MYLAR	0.0047MF	5%	50V	
C567	1-130-479-00	MYLAR	0.0047MF	5%	50V	
C568	1-123-611-00	ELECT	1MF	20%	50V	
C569	1-161-021-11	CERAMIC	0.0047MF	10%	25V	
C571	1-124-236-00	ELECT	47MF	20%	16V	
C572	1-126-101-11	ELECT	100MF	20%	16V	
C573	1-161-055-00	CERAMIC	0.022MF	10%	25V	
C574	1-126-101-11	ELECT	100MF	20%	16V	
C575	1-161-055-00	CERAMIC	0.022MF	10%	25V	
C576	1-126-101-11	ELECT	100MF	20%	16V	
C577	1-161-055-00	CERAMIC	0.022MF	10%	25V	
C578	1-124-236-00	ELECT	47MF	20%	16V	
C585	1-124-462-00	ELECT	10MF	20%	16V	
C586	1-161-055-00	CERAMIC	0.022MF	10%	25V	
C587	1-124-236-00	ELECT	47MF	20%	16V	

CONNECTOR

CN501	*1-564-009-00	PIN, CONNECTOR 10P	
CN502	*1-564-002-00	PIN, CONNECTOR 3P	
CN503	*1-564-004-00	PIN, CONNECTOR 5P	
CN504	*1-564-005-00	PIN, CONNECTOR 6P	
CN505	*1-564-005-00	PIN, CONNECTOR 6P	

TRIMMER

CV101	1-141-227-00	CAP, CERAMIC TRIMMER 20PF	

DIODE

D501	8-719-911-19	DIODE 1SS119	
D502	8-719-911-19	DIODE 1SS119	
D551	8-719-911-19	DIODE 1SS119	
D552	8-719-911-19	DIODE 1SS119	

FILTER

FL500	1-231-412-00	FILTER BLOCK	

IC

IC501	8-759-927-56	IC BA7021	
IC502	8-759-200-60	IC TA7060AP	
IC505	8-759-200-05	IC TC40H008P	
IC506	8-752-006-10	IC CX20061	
IC508	8-759-220-04	IC TC40H004P	
IC510	8-759-729-03	IC NJM2903D	
IC511	8-759-220-00	IC TC40H000P	
IC551	8-759-938-56	IC MB88201H-523M	
IC552	8-759-207-28	IC TC9015P	

COIL

L501	1-408-409-00	INDUCTOR	10UH
L502	1-408-421-00	INDUCTOR	100UH
L503	1-408-420-00	INDUCTOR	82UH
L504	1-408-421-00	INDUCTOR	100UH
L511	1-408-421-00	INDUCTOR	100UH
L551	1-408-421-00	INDUCTOR	100UH
L552	1-408-420-00	INDUCTOR	82UH
L553	1-408-421-00	INDUCTOR	100UH

TRANSISTOR

Q501	8-729-600-27	TRANSISTOR 2SC634SP
Q502	8-729-600-27	TRANSISTOR 2SC634SP
Q503	8-729-600-27	TRANSISTOR 2SC634SP
Q504	8-729-600-27	TRANSISTOR 2SC634SP
Q505	8-729-117-54	TRANSISTOR 2SA1175
Q506	8-729-169-02	TRANSISTOR 2SC2690A
Q507	8-729-169-02	TRANSISTOR 2SC2690A
Q509	8-729-600-27	TRANSISTOR 2SC634SP
Q510	8-729-600-27	TRANSISTOR 2SC634SP
Q511	8-729-603-30	TRANSISTOR 2SC403SP-3

RESISTOR

R500	1-249-425-11	CARBON	4.7K	5%	1/4W
R501	1-249-441-11	CARBON	100K	5%	1/4W
R502	1-249-441-11	CARBON	100K	5%	1/4W
R503	1-249-417-11	CARBON	1K	5%	1/4W
R504	1-249-417-11	CARBON	1K	5%	1/4W
R505	1-249-417-11	CARBON	1K	5%	1/4W
R506	1-249-414-11	CARBON	560	5%	1/4W
R507	1-249-407-11	CARBON	150	5%	1/4W
R508	1-249-417-11	CARBON	1K	5%	1/4W
R510	1-249-429-11	CARBON	10K	5%	1/4W
R511	1-249-417-11	CARBON	1K	5%	1/4W
R512	1-249-413-11	CARBON	470	5%	1/4W
R513	1-249-414-11	CARBON	560	5%	1/4W
R514	1-249-433-11	CARBON	22K	5%	1/4W
R515	1-249-414-11	CARBON	560	5%	1/4W
R516	1-249-415-11	CARBON	680	5%	1/4W
R517	1-249-419-11	CARBON	1.5K	5%	1/4W
R518	1-249-423-11	CARBON	3.3K	5%	1/4W
R519	1-249-405-11	CARBON	100	5%	1/4W
R520	1-249-421-11	CARBON	2.2K	5%	1/4W
R521	1-249-425-11	CARBON	4.7K	5%	1/4W
R522	1-249-421-11	CARBON	2.2K	5%	1/4W

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Ref.No	Part No.	Description				Remark
R523	1-249-421-11	CARBON	2.2K	5%	1/4W	
R524	1-249-425-11	CARBON	4.7K	5%	1/4W	
R525	1-247-741-11	CARBON	150	5%	1/2W	
R526	1-247-741-11	CARBON	150	5%	1/2W	
R527	1-249-417-11	CARBON	1K	5%	1/4W	
R530	1-249-427-11	CARBON	6.8K	5%	1/4W	
R531	1-249-428-11	CARBON	8.2K	5%	1/4W	
R540	1-249-410-11	CARBON	270	5%	1/4W	
R551	1-249-408-11	CARBON	180	5%	1/4W	
R552	1-215-430-00	CARBON	2.4K	5%	1/4W	
R553	1-249-419-11	CARBON	1.5K	5%	1/4W	
R554	1-215-493-00	CARBON	1M	5%	1/4W	
R555	1-247-895-00	CARBON	470	5%	1/4W	
R556	1-249-425-11	CARBON	4.7K	5%	1/4W	
R557	1-249-418-11	CARBON	1.2K	5%	1/4W	
R558	1-249-416-11	CARBON	820	5%	1/4W	
R559	1-249-427-11	CARBON	6.8K	5%	1/4W	
R560	1-247-895-00	CARBON	470K	5%	1/4W	
R566	1-249-405-11	CARBON	100	5%	1/4W	
R567	1-249-421-11	CARBON	2.2K	5%	1/4W	
R568	1-249-413-11	CARBON	470	5%	1/4W	
R569	1-249-429-11	CARBON	10K	5%	1/4W	
R570	1-249-429-11	CARBON	10K	5%	1/4W	
R571	1-215-446-00	METAL	11K	1%	1/6W	
R572	1-215-434-00	METAL	3.6K	1%	1/6W	
R573	1-249-441-11	CARBON	100K	5%	1/4W	
R574	1-249-417-11	CARBON	1K	5%	1/4W	
R575	1-249-437-11	CARBON	47K	5%	1/4W	
R576	1-249-437-11	CARBON	47K	5%	1/4W	
R577	1-249-429-11	CARBON	10K	5%	1/4W	
R578	1-249-429-11	CARBON	10K	5%	1/4W	
R579	1-249-416-11	CARBON	820	5%	1/4W	
R580	1-249-420-11	CARBON	1.8K	5%	1/4W	
R581	1-249-421-11	CARBON	2.2K	5%	1/4W	
R582	1-249-417-11	CARBON	1K	5%	1/4W	
R583	1-249-403-11	CARBON	68	5%	1/4W	
R584	1-249-403-11	CARBON	68	5%	1/4W	
R585	1-249-403-11	CARBON	68	5%	1/4W	
R586	1-249-405-11	CARBON	100	5%	1/4W	

CRYSTAL

X551	1-527-722-00	OSCILLATOR, CRYSTAL

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CAPACITOR

C001	1-161-021-11	CERAMIC	0.047MF	10%	25V
C002	1-162-217-31	CERAMIC	56PF	5%	50V
C003	1-162-217-31	CERAMIC	56PF	5%	50V
C004	1-162-198-31	CERAMIC	8.2PF	10%	50V
C005	1-162-205-31	CERAMIC	18PF	5%	50V

Ref.No	Part No.	Description			Remark
C006	1-162-198-31	CERAMIC	8.2PF	10%	50V
C007	1-109-545-00	MICA	270PF	5%	50V
C008	1-109-545-00	MICA	270PF	5%	50V
C009	1-161-494-00	CERAMIC	0.022MF		25V
C010	1-161-494-00	CERAMIC	0.022MF		25V
C011	1-124-462-00	ELECT	10MF	20%	16V
C012	1-124-224-00	ELECT	47MF	20%	6.3V
C013	1-162-287-31	CERAMIC	270PF	10%	25V
C014	1-162-282-31	CERAMIC	100PF	10%	50V
C015	1-162-284-31	CERAMIC	150PF	10%	50V
C016	1-162-209-31	CERAMIC	27PF	5%	50V
C017	1-124-462-00	ELECT	10MF	20%	16V
C018	1-161-494-00	CERAMIC	0.022MF		25V
C019	1-124-119-00	ELECT	330MF	20%	16V
C020	1-161-021-11	CERAMIC	0.047MF	10%	25V
C021	1-161-379-00	CERAMIC	0.01MF	30%	16V
C022	1-161-379-00	CERAMIC	0.01MF	30%	16V
C023	1-161-379-00	CERAMIC	0.01MF	30%	16V
C024	1-126-101-11	ELECT	100MF	20%	16V
C025	1-162-215-31	CERAMIC	47PF	5%	50V
C026	1-162-201-31	CERAMIC	12PF	5%	50V
C027	1-126-101-11	ELECT	100MF	20%	16V
C028	1-109-540-00	MICA	180PF	5%	50V
C029	1-162-192-31	CERAMIC	2.7PF	10%	50V
C030	1-162-211-31	CERAMIC	33PF	5%	50V
C031	1-162-205-31	CERAMIC	18PF	5%	50V
C032	1-162-215-31	CERAMIC	47PF	5%	50V
C034	1-124-477-11	ELECT	47MF	20%	16V
C036	1-162-215-31	CERAMIC	47PF	5%	50V
C037	1-162-286-31	CERAMIC	220PF	10%	50V
C038	1-161-043-00	CERAMIC	0.0022MF	10%	25V
C039	1-162-286-31	CERAMIC	220PF	10%	50V
C040	1-124-462-00	ELECT	10MF	20%	16V
C041	1-124-462-00	ELECT	10MF	20%	16V
C042	1-124-477-11	ELECT	47MF	20%	16V
C043	1-161-021-11	CERAMIC	0.047MF	10%	25V
C044	1-124-499-11	ELECT	1MF	20%	50V
C045	1-124-477-11	ELECT	47MF	20%	16V
C046	1-161-772-11	CERAMIC	0.1MF	10%	25V
C047	1-124-499-11	ELECT	1MF	20%	50V
C048	1-124-908-11	ELECT	22MF	20%	25V
C049	1-162-218-31	CERAMIC	62PF	5%	50V
C050	1-162-201-31	CERAMIC	12PF	5%	50V
C051	1-161-494-00	CERAMIC	0.022MF		25V
C052	1-162-201-31	CERAMIC	12PF	5%	50V
C053	1-124-477-11	ELECT	47MF	20%	16V
C054	1-124-477-11	ELECT	47MF	20%	16V
C055	1-161-494-00	CERAMIC	0.022MF		25V
C056	1-124-462-00	ELECT	10MF	20%	16V
C057	1-161-494-00	CERAMIC	0.022MF		25V
C060	1-162-198-31	CERAMIC	8.2PF	5%	50V
C061	1-162-213-31	CERAMIC	39PF	5%	50V
C062	1-162-215-31	CERAMIC	47PF	10%	50V

Ref.No	Part No.	Description			Remark
C063	1-162-203-31	CERAMIC	15PF	5%	50V
C101	1-162-211-31	CERAMIC	33PF	5%	50V
C102	1-162-211-31	CERAMIC	33PF	5%	50V
C103	1-124-444-00	ELECT	220MF	20%	6.3V
C104	1-124-499-11	ELECT	1MF	20%	50V
C105	1-124-443-00	ELECT	100MF	20%	10V
C106	1-124-477-11	ELECT	47MF	20%	16V
C107	1-124-446-11	ELECT	47MF	20%	10V
C108	1-124-477-11	ELECT	47MF	20%	16V
C109	1-124-443-11	ELECT	100MF	20%	10V
C110	1-124-443-11	ELECT	100MF	20%	10V
C111	1-124-443-11	ELECT	100MF	20%	10V
C112	1-124-908-11	ELECT	22MF	20%	25V
C113	1-161-021-11	CERAMIC	0.047MF	10%	25V
C114	1-124-446-11	ELECT	47MF	20%	10V
C115	1-161-379-00	CERAMIC	0.01MF	30%	16V
C116	1-161-494-00	CERAMIC	0.022MF		25V
C117	1-124-462-00	ELECT	10MF	20%	16V
C118	1-162-203-31	CERAMIC	15PF	5%	50V
C119	1-162-207-31	CERAMIC	22PF	5%	50V
C120	1-162-284-31	CERAMIC	150PF	10%	50V
C121	1-161-494-00	CERAMIC	0.022MF		25V
C122	1-161-021-11	CERAMIC	0.047MF	10%	25V
C123	1-162-211-31	CERAMIC	33PF	5%	50V
C124	1-161-379-00	CERAMIC	0.01MF	30%	16V
C125	1-124-446-11	ELECT	47MF	20%	10V
C126	1-131-381-00	TANTALUM	47MF	20%	6.3V
C127	1-124-446-11	ELECT	47MF	20%	10V
C128	1-124-446-11	ELECT	47MF	20%	10V
C129	1-130-483-00	MYLAR	0.01MF	5%	50V
C130	1-161-045-00	CERAMIC	0.0033MF	10%	25V
C131	1-162-286-31	CERAMIC	220PF	10%	50V
C132	1-162-286-31	CERAMIC	220PF	10%	50V
C133	1-161-047-00	CERAMIC	0.0047MF	10%	25V
C134	1-162-291-31	CERAMIC	560PF	10%	50V
C135	1-161-772-11	CERAMIC	0.1MF	10%	25V
C136	1-124-499-11	ELECT	1MF	20%	50V
C137	1-162-215-31	CERAMIC	47PF	5%	50V
C138	1-162-215-31	CERAMIC	47PF	5%	50V
C139	1-124-446-11	ELECT	47MF	20%	10V
C140	1-130-483-00	MYLAR	0.01MF	5%	50V
C141	1-124-446-11	ELECT	47MF	20%	10V
C142	1-130-483-00	MYLAR	0.01MF	5%	50V
C143	1-130-483-00	MYLAR	0.01MF	5%	50V
C144	1-162-292-31	CERAMIC	680PF	10%	50V
C150	1-130-483-00	MYLAR	0.01MF	5%	50V
C151	1-161-379-00	CERAMIC	0.01MF	30%	16V
C201	1-162-219-31	CERAMIC	68PF	5%	50V
C202	1-124-119-00	ELECT	330MF	20%	16V
C203	1-162-207-31	CERAMIC	22PF	5%	50V
C205	1-162-218-31	CERAMIC	62PF	5%	50V
C206	1-162-209-31	CERAMIC	27PF	5%	50V
C207	1-162-290-31	CERAMIC	470PF	10%	50V
C208	1-124-477-11	ELECT	47MF	20%	16V
C209	1-161-039-00	CERAMIC	0.001MF	10%	25V
C210	1-124-446-11	ELECT	47MF	20%	10V
C211	1-124-463-00	ELECT	0.1MF	20%	50V
C212	1-161-494-00	CERAMIC	0.022MF		25V
C213	1-124-462-00	ELECT	10MF	20%	16V
C214	1-124-446-11	ELECT	47MF	20%	10V
C215	1-124-462-00	ELECT	10MF	20%	16V
C216	1-161-494-00	CERAMIC	0.022MF		25V
C217	1-124-443-00	ELECT	100MF	20%	10V
C218	1-124-270-11	ELECT	0.47MF	20%	50V
C219	1-126-101-11	ELECT	100MF	20%	16V
C220	1-161-494-00	CERAMIC	0.022MF		25V
C221	1-161-494-00	CERAMIC	0.022MF		25V
C222	1-162-217-31	CERAMIC	56PF	5%	50V
C223	1-162-217-31	CERAMIC	56PF	5%	50V
C224	1-161-494-00	CERAMIC	0.022MF		25V
C225	1-161-039-00	CERAMIC	0.001MF	10%	25V
C226	1-162-209-31	CERAMIC	27PF	5%	50V
C227	1-162-215-31	CERAMIC	47PF	5%	50V
C228	1-124-274-00	ELECT	4.7MF	20%	50V
C229	1-162-286-31	CERAMIC	220PF	10%	50V
C230	1-161-040-00	CERAMIC	0.0012MF	10%	25V
C231	1-161-494-00	CERAMIC	0.022MF		25V
C232	1-124-462-00	ELECT	10MF	20%	16V
C233	1-162-282-31	CERAMIC	100PF	10%	50V
C234	1-162-211-31	CERAMIC	33PF	5%	50V
C235	1-162-288-31	CERAMIC	330PF	10%	50V
C236	1-124-902-00	ELECT	0.47MF	20%	50V
C237	1-124-446-11	ELECT	47MF	20%	10V
C238	1-161-494-00	CERAMIC	0.022MF		25V
C239	1-124-247-00	ELECT	10MF	20%	25V
C250	1-161-379-00	CERAMIC	0.01MF	30%	16V
C251	1-162-203-31	CERAMIC	15PF	5%	50V
C252	1-161-379-00	CERAMIC	0.01MF	30%	16V
C253	1-161-379-00	CERAMIC	0.01MF	30%	16V
C254	1-124-462-00	ELECT	10MF	20%	16V
C255	1-124-462-00	ELECT	10MF	20%	16V
C256	1-124-462-00	ELECT	10MF	20%	16V
C301	1-162-215-31	CERAMIC	47PF	5%	50V
C302	1-124-462-00	ELECT	10MF	20%	16V
C303	1-162-286-31	CERAMIC	220PF	10%	50V
C304	1-124-462-00	ELECT	10MF	20%	16V
C305	1-161-053-00	CERAMIC	0.015MF	10%	25V
C306	1-124-245-00	ELECT	4.7MF	20%	25V
C307	1-124-446-11	ELECT	47MF	20%	10V
C308	1-162-292-31	CERAMIC	680PF	10%	50V
C309	1-161-024-00	CERAMIC	0.082MF	10%	25V
C310	1-109-547-00	MICA	330PF	5%	50V
C311	1-109-547-00	MICA	330PF	5%	50V
C312	1-161-494-00	CERAMIC	0.022MF		25V
C313	1-124-446-11	ELECT	47MF	20%	10V
C401	1-161-494-00	CERAMIC	0.022MF		25V

DM-14

Ref.No	Part No.	Description			Remark
C402	1-124-119-00	ELECT	330MF	20%	16V
C403	1-124-119-00	ELECT	330MF	20%	16V
C404	1-161-494-00	CERAMIC	0.022MF		25V
C405	1-124-224-00	ELECT	47MF	20%	6.3V
C406	1-161-494-00	CERAMIC	0.022MF		25V
C407	1-124-499-11	ELECT	1MF	20%	50V
C408	1-124-477-11	ELECT	47MF	20%	16V
C409	1-161-494-00	CERAMIC	0.022MF		25V
C410	1-124-477-11	ELECT	47MF	20%	16V
C411	1-161-494-00	CERAMIC	0.022MF		25V
C412	1-124-224-00	ELECT	47MF	20%	6.3V
C413	1-124-477-11	ELECT	47MF	20%	16V

FILTER

CF101	1-527-604-00	FILTER, CERAMIC (3.58MHz)

CONNECTOR

CN2	*1-564-005-00	PIN, CONNECTOR 6P
CN001	*1-564-002-00	PIN, CONNECTOR 3P
CN003	*1-564-007-00	PIN, CONNECTOR 8P
CN004	*1-564-009-00	PIN, CONNECTOR 10P
CN005	*1-564-007-00	PIN, CONNECTOR 8P

DIODE

D001	8-719-110-16	ZENER DIODE RD10ESB1
D101	8-719-911-19	DIODE 1SS119
D201	8-719-907-19	DIODE FC52M-5
D202	8-719-911-19	DIODE 1SS119
D203	8-719-908-06	ZENER DIODE ERA81-005

IC

IC001	8-759-600-99	IC M51481P
IC002	8-752-320-32	IC CXL5001P
IC003	8-752-006-10	IC CX20061
IC101	8-752-320-31	IC CXL1004P
IC102	8-759-950-07	IC SN75107BN
IC103	8-752-030-44	IC CXA1018S
IC104	8-759-902-21	IC SN74LS221N
IC201	8-759-912-67	IC PA9003
IC202	8-759-902-21	IC SN74LS221N
IC203	8-759-990-82	IC TL082CP
IC204	8-759-900-08	IC SN74LS08N
IC205	8-759-220-04	IC TC40H004P
IC206	8-759-202-24	IC TC74HC86P
IC301	8-759-912-64	IC PA0009
IC401⚠	8-759-179-05	IC UPC7905H
IC402⚠	8-759-708-09	IC NJM78L09A

COIL

L001	1-408-414-00	INDUCTOR	27UH
L002	1-408-412-00	INDUCTOR	18UH
L003	1-408-412-00	INDUCTOR	18UH
L004	1-408-409-00	INDUCTOR	10UH

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No	Part No.	Description		Remark
L005	1-408-410-00	INDUCTOR	12UH	
L006	1-408-412-00	INDUCTOR	18UH	
L007	1-408-421-00	INDUCTOR	100UH	
L008	1-408-421-00	INDUCTOR	100UH	
L009	1-408-419-00	INDUCTOR	68UH	
L010	1-408-419-00	INDUCTOR	68UH	
L012	1-408-414-00	INDUCTOR	27UH	
L013	1-408-409-00	INDUCTOR	10UH	
L014	1-408-409-00	INDUCTOR	10UH	
L015	1-408-409-00	INDUCTOR	10UH	
L016	1-408-409-00	INDUCTOR	10UH	
L017	1-408-415-00	INDUCTOR	33UH	
L018	1-408-425-00	INDUCTOR	220UH	
L019	1-408-409-00	INDUCTOR	10UH	
L020	1-408-421-00	INDUCTOR	100UH	
L101	1-408-415-00	INDUCTOR	33UH	
L102	1-408-409-00	INDUCTOR	10UH	
L103	1-408-409-00	INDUCTOR	10UH	
L104	1-408-409-00	INDUCTOR	10UH	
L105	1-408-409-00	INDUCTOR	10UH	
L106	1-408-421-00	INDUCTOR	100UH	
L107	1-408-409-00	INDUCTOR	10UH	
L108	1-408-397-00	INDUCTOR	1UH	
L109	1-408-409-00	INDUCTOR	10UH	
L110	1-408-409-00	INDUCTOR	10UH	
L111	1-408-409-00	INDUCTOR	10UH	
L112	1-408-409-00	INDUCTOR	10UH	
L113	1-408-409-00	INDUCTOR	10UH	
L201	1-408-421-00	INDUCTOR	100UH	
L202	1-408-416-00	INDUCTOR	39UH	
L203	1-408-409-00	INDUCTOR	10UH	
L204	1-408-417-00	INDUCTOR	47UH	
L205	1-408-417-00	INDUCTOR	47UH	
L206	1-408-413-00	INDUCTOR	22UH	
L207	1-408-409-00	INDUCTOR	10UH	
L208	1-408-409-00	INDUCTOR	10UH	
L209	1-408-409-00	INDUCTOR	10UH	
L210	1-408-415-00	INDUCTOR	33UH	
L211	1-408-419-00	INDUCTOR	68UH	
L212	1-408-409-00	INDUCTOR	10UH	
L213	1-408-409-00	INDUCTOR	10UH	
L301	1-408-422-00	INDUCTOR	120UH	

TRANSISTOR

Q001	8-729-600-27	TRANSISTOR	2SC634SP
Q002	8-729-600-27	TRANSISTOR	2SC634SP
Q003	8-729-600-27	TRANSISTOR	2SC634SP
Q004	8-729-600-27	TRANSISTOR	2SC634SP
Q005	8-729-600-27	TRANSISTOR	2SC634SP
Q006	8-729-600-27	TRANSISTOR	2SC634SP
Q007	8-729-600-27	TRANSISTOR	2SC634SP
Q008	8-729-600-27	TRANSISTOR	2SC634SP
Q009	8-729-600-27	TRANSISTOR	2SC634SP

Ref.No	Part No.	Description	Remark
Q101	8-729-600-27	TRANSISTOR 2SC634SP	
Q102	8-729-600-27	TRANSISTOR 2SC634SP	
Q103	8-729-117-54	TRANSISTOR 2SA1175	
Q104	8-729-600-27	TRANSISTOR 2SC634SP	
Q105	8-729-117-54	TRANSISTOR 2SA1175	
Q106	8-729-112-06	TRANSISTOR 2SA1206	
Q107	8-729-190-12	TRANSISTOR 2SC2901	
Q108	8-729-218-42	TRANSISTOR 2SK184	
Q109	8-729-600-27	TRANSISTOR 2SC634SP	
Q201	8-729-600-27	TRANSISTOR 2SC634SP	
Q202	8-729-600-27	TRANSISTOR 2SC634SP	
Q203	8-729-117-54	TRANSISTOR 2SA1175	
Q204	8-729-117-54	TRANSISTOR 2SA1175	
Q205	8-729-600-27	TRANSISTOR 2SC634SP	
Q206	8-729-600-27	TRANSISTOR 2SC634SP	
Q207	8-729-600-27	TRANSISTOR 2SC634SP	
Q208	8-729-600-27	TRANSISTOR 2SC634SP	
Q209	8-729-600-27	TRANSISTOR 2SC634SP	
Q210	8-729-600-27	TRANSISTOR 2SC634SP	
Q211	8-729-117-54	TRANSISTOR 2SA1175	
Q212	8-729-218-42	TRANSISTOR 2SK184	
Q301	8-729-201-04	TRANSISTOR 2SC2878	
Q302	8-729-600-27	TRANSISTOR 2SC634SP	
Q303	8-729-600-27	TRANSISTOR 2SC634SP	
Q401	8-729-169-02	TRANSISTOR 2SC2690A	

RESISTOR

Ref.No	Part No.	Description				Remark
R001	1-249-429-11	CARBON	10K	5%	1/4W	
R002	1-249-417-11	CARBON	1K	5%	1/4W	
R003	1-249-417-11	CARBON	1K	5%	1/4W	
R004	1-249-426-11	CARBON	5.6K	5%	1/4W	
R005	1-249-418-11	CARBON	1.2K	5%	1/4W	
R006	1-249-415-11	CARBON	680	5%	1/4W	
R007	1-249-405-11	CARBON	100	5%	1/4W	
R008	1-249-411-11	CARBON	330	5%	1/4W	
R009	1-249-417-11	CARBON	1K	5%	1/4W	
R010	1-249-433-11	CARBON	22K	5%	1/4W	
R011	1-249-417-11	CARBON	1K	5%	1/4W	
R012	1-249-421-11	CARBON	2.2K	5%	1/4W	
R013	1-249-417-11	CARBON	1K	5%	1/4W	
R014	1-249-417-11	CARBON	1K	5%	1/4W	
R015	1-249-419-11	CARBON	1.5K	5%	1/4W	
R016	1-249-418-11	CARBON	1.2K	5%	1/4W	
R017	1-249-415-11	CARBON	680	5%	1/4W	
R018	1-249-436-11	CARBON	39K	5%	1/4W	
R019	1-249-432-11	CARBON	18K	5%	1/4W	
R020	1-249-417-11	CARBON	1K	5%	1/4W	
R021	1-249-417-11	CARBON	1K	5%	1/4W	
R022	1-249-417-11	CARBON	1K	5%	1/4W	
R023	1-249-417-11	CARBON	1K	5%	1/4W	
R025	1-249-417-11	CARBON	1K	5%	1/4W	
R026	1-249-421-11	CARBON	2.2K	5%	1/4W	
R027	1-249-421-11	CARBON	2.2K	5%	1/4W	
R028	1-215-493-00	CARBON	1M	5%	1/4W	
R029	1-249-429-11	CARBON	10K	5%	1/4W	
R030	1-249-413-11	CARBON	470	5%	1/4W	
R031	1-249-417-11	CARBON	1K	5%	1/4W	
R032	1-249-421-11	CARBON	2.2K	5%	1/4W	
R033	1-249-421-11	CARBON	2.2K	5%	1/4W	
R034	1-249-421-11	CARBON	2.2K	5%	1/4W	
R035	1-249-417-11	CARBON	1K	5%	1/4W	
R050	1-249-417-11	CARBON	1K	5%	1/4W	
R051	1-249-416-11	CARBON	820	5%	1/4W	
R053	1-215-412-00	CARBON	430	5%	1/4W	
R101	1-249-417-11	CARBON	1K	5%	1/4W	
R102	1-249-417-11	CARBON	1K	5%	1/4W	
R103	1-249-417-11	CARBON	1K	5%	1/4W	
R104	1-215-493-00	CARBON	1M	5%	1/4W	
R105	1-249-416-11	CARBON	820	5%	1/4W	
R106	1-249-423-11	CARBON	3.3K	5%	1/4W	
R107	1-249-413-11	CARBON	470	5%	1/4W	
R108	1-249-423-11	CARBON	3.3K	5%	1/4W	
R109	1-249-423-11	CARBON	3.3K	5%	1/4W	
R110	1-249-417-11	CARBON	1K	5%	1/4W	
R111	1-249-419-11	CARBON	1.5K	5%	1/4W	
R112	1-249-417-11	CARBON	1K	5%	1/4W	
R113	1-249-415-11	CARBON	680	5%	1/4W	
R114	1-249-427-11	CARBON	6.8K	5%	1/4W	
R115	1-215-489-00	CARBON	680K	5%	1/4W	
R116	1-249-423-11	CARBON	3.3K	5%	1/4W	
R117	1-249-437-11	CARBON	47K	5%	1/4W	
R118	1-249-419-11	CARBON	1.5K	5%	1/4W	
R119	1-249-433-11	CARBON	22K	5%	1/4W	
R120	1-247-891-00	CARBON	330K	5%	1/4W	
R121	1-249-417-11	CARBON	1K	5%	1/4W	
R122	1-247-887-00	CARBON	220K	5%	1/4W	
R123	1-249-441-11	CARBON	100K	5%	1/4W	
R124	1-249-441-11	CARBON	100K	5%	1/4W	
R125	1-247-881-00	CARBON	120K	5%	1/4W	
R126	1-247-895-00	CARBON	470K	5%	1/4W	
R127	1-249-430-11	CARBON	12K	5%	1/4W	
R128	1-249-441-11	CARBON	100K	5%	1/4W	
R129	1-249-437-11	CARBON	47K	5%	1/4W	
R130	1-249-436-11	CARBON	39K	5%	1/4W	
R131	1-249-441-11	CARBON	100K	5%	1/4W	
R132	1-249-436-11	CARBON	39K	5%	1/4W	
R133	1-249-440-11	CARBON	82K	5%	1/4W	
R134	1-247-895-00	CARBON	470K	5%	1/4W	
R135	1-249-421-11	CARBON	2.2K	5%	1/4W	
R136	1-249-441-11	CARBON	100K	5%	1/4W	
R137	1-247-895-00	CARBON	470K	5%	1/4W	
R138	1-249-434-11	CARBON	27K	5%	1/4W	
R139	1-249-434-11	CARBON	27K	5%	1/4W	
R140	1-249-437-11	CARBON	47K	5%	1/4W	
R141	1-249-441-11	CARBON	100K	5%	1/4W	
R142	1-249-433-11	CARBON	22K	5%	1/4W	

DM-14 RF-13

Ref.No	Part No.	Description				Remark
R143	1-249-417-11	CARBON	1K	5%	1/4W	
R144	1-247-895-00	CARBON	470K	5%	1/4W	
R145	1-249-433-11	CARBON	22K	5%	1/4W	
R201	1-249-417-11	CARBON	1K	5%	1/4W	
R202	1-249-417-11	CARBON	1K	5%	1/4W	
R203	1-249-419-11	CARBON	1.5K	5%	1/4W	
R204	1-249-417-11	CARBON	1K	5%	1/4W	
R205	1-249-413-11	CARBON	470	5%	1/4W	
R206	1-249-417-11	CARBON	1K	5%	1/4W	
R208	1-249-417-11	CARBON	1K	5%	1/4W	
R209	1-215-413-00	METAL	470	1%	1/6W	
R210	1-215-414-00	METAL	510	1%	1/6W	
R211	1-249-413-11	CARBON	470	5%	1/4W	
R212	1-215-487-00	CARBON	560K	5%	1/4W	
R213	1-247-887-00	CARBON	220K	5%	1/4W	
R214	1-249-417-11	CARBON	1K	5%	1/4W	
R215	1-249-416-11	CARBON	820	5%	1/4W	
R216	1-249-405-11	CARBON	100	5%	1/4W	
R217	1-249-441-11	CARBON	100K	5%	1/4W	
R218	1-249-417-11	CARBON	1K	5%	1/4W	
R220	1-249-421-11	CARBON	2.2K	5%	1/4W	
R221	1-249-405-11	CARBON	100	5%	1/4W	
R222	1-249-417-11	CARBON	1K	5%	1/4W	
R223	1-249-426-11	CARBON	5.6K	5%	1/4W	
R224	1-249-421-11	CARBON	2.2K	5%	1/4W	
R226	1-247-895-00	CARBON	470K	5%	1/4W	
R227	1-247-895-00	CARBON	470K	5%	1/4W	
R228	1-247-895-00	CARBON	470K	5%	1/4W	
R229	1-247-895-00	CARBON	470K	5%	1/4W	
R230	1-249-433-11	CARBON	22K	5%	1/4W	
R231	1-249-426-11	CARBON	5.6K	5%	1/4W	
R232	1-249-423-11	CARBON	3.3K	5%	1/4W	
R233	1-249-433-11	CARBON	22K	5%	1/4W	
R234	1-249-405-11	CARBON	100	5%	1/4W	
R235	1-249-429-11	CARBON	10K	5%	1/4W	
R236	1-249-429-11	CARBON	10K	5%	1/4W	
R237	1-249-425-11	CARBON	4.7K	5%	1/4W	
R238	1-249-429-11	CARBON	10K	5%	1/4W	
R239	1-249-417-11	CARBON	1K	5%	1/4W	
R240	1-249-411-11	CARBON	330	5%	1/4W	
R241	1-249-405-11	CARBON	100	5%	1/4W	
R242	1-215-493-00	CARBON	1M	5%	1/4W	
R243	1-247-891-00	CARBON	330K	5%	1/4W	
R244	1-249-421-11	CARBON	2.2K	5%	1/4W	
R245	1-249-433-11	CARBON	22K	5%	1/4W	
R246	1-249-421-11	CARBON	2.2K	5%	1/4W	
R247	1-249-433-11	CARBON	22K	5%	1/4W	
R248	1-249-437-11	CARBON	47K	5%	1/4W	
R250	1-249-419-11	CARBON	1.5K	5%	1/4W	
R301	1-249-417-11	CARBON	1K	5%	1/4W	
R302	1-249-429-11	CARBON	10K	5%	1/4W	
R303	1-249-416-11	CARBON	820	5%	1/4W	
R304	1-249-413-11	CARBON	470	5%	1/4W	

Ref.No	Part No.	Description				Remark
R305	1-249-417-11	CARBON	1K	5%	1/4W	
R306	1-249-419-11	CARBON	1.5K	5%	1/4W	
R307	1-249-426-11	CARBON	5.6K	5%	1/4W	
R308	1-249-425-11	CARBON	4.7K	5%	1/4W	
R309	1-249-417-11	CARBON	1K	5%	1/4W	
R310	1-247-883-00	CARBON	150K	5%	1/4W	
R311	1-249-426-11	CARBON	5.6K	5%	1/4W	
R312	1-249-430-11	CARBON	12K	5%	1/4W	
R313	1-249-421-11	CARBON	2.2K	5%	1/4W	
R314	1-249-441-11	CARBON	100K	5%	1/4W	
R315	1-249-437-11	CARBON	47K	5%	1/4W	
R316	1-249-426-11	CARBON	5.6K	5%	1/4W	
R401	1-249-413-11	CARBON	470	5%	1/4W	
R402 ⚠	1-215-908-00	WIREWOUND	33	10%	2W	F

VARIABLE RESISTOR

RV1	1-228-993-00	RES, ADJ, CARBON 4.7K
RV2	1-228-990-00	RES, ADJ, CARBON 1K
RV003	1-228-991-00	RES, ADJ, CARBON 2.2K
RV101	1-228-994-00	RES, ADJ, CARBON 10K
RV102	1-228-990-00	RES, ADJ, CARBON 1K
RV103	1-228-996-00	RES, ADJ, CARBON 47K
RV104	1-228-996-00	RES, ADJ, CARBON 47K
RV105	1-228-994-00	RES, ADJ, CARBON 10K
RV201	1-228-991-00	RES, ADJ, CARBON 2.2K
RV301	1-228-990-00	RES, ADJ, CARBON 1K

CRYSTAL

X001	1-567-161-00	VIBRATOR, CRYSTAL (10.73836MHz)

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*A-6421-170-A	RF-13 (N) BOARD, COMPLETE	
	**********	
*2-277-426-01	CLAMP	

CAPACITOR

C1	1-123-611-00	ELECT	1MF	20%	50V
C2	1-162-283-31	CERAMIC	120PF	10%	50V
C3	1-124-462-00	ELECT	10MF	20%	16V
C5	1-162-213-31	CERAMIC	39PF	5%	50V
C6	1-162-219-31	CERAMIC	68PF	5%	50V
C7	1-162-211-31	CERAMIC	33PF	5%	50V
C8	1-161-055-00	CERAMIC	0.022MF	10%	25V
C9	1-161-055-00	CERAMIC	0.022MF	10%	25V
C10	1-124-236-00	ELECT	47MF	20%	16V
C11	1-161-055-00	CERAMIC	0.022MF	10%	25V
C12	1-161-055-00	CERAMIC	0.022MF	10%	25V
C13	1-124-236-00	ELECT	47MF	20%	16V
C51	1-162-195-31	CERAMIC	4.7PF	10%	50V
C52	1-162-211-31	CERAMIC	33PF	5%	50V
C101	1-161-379-00	CERAMIC	0.01MF	30%	16V
C102	1-161-379-00	CERAMIC	0.01MF	30%	16V

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No	Part No.	Description			Remark
C103	1-124-462-00	ELECT	10MF	20%	16V
C104	1-124-462-00	ELECT	10MF	20%	16V
C105	1-161-379-00	CERAMIC	0.01MF	30%	16V
C106	1-161-379-00	CERAMIC	0.01MF	30%	16V
C107	1-124-462-00	ELECT	10MF	20%	16V
C108	1-124-462-00	ELECT	10MF	20%	16V
C109	1-124-236-00	ELECT	47MF	20%	16V
C110	1-162-215-31	CERAMIC	47PF	5%	50V
C111	1-124-236-00	ELECT	47MF	20%	16V
C112	1-162-282-31	CERAMIC	100PF	10%	50V
C113	1-161-055-00	CERAMIC	0.022MF	10%	25V
C114	1-124-236-00	ELECT	47MF	20%	16V
		CONNECTOR			
CN1	*1-564-009-00	PIN, CONNECTOR 10P			
CN2	*1-564-005-00	PIN, CONNECTOR 6P			
CN3	*1-564-004-00	PIN, CONNECTOR 5P			
CN4	*1-564-002-00	PIN, CONNECTOR 3P			
CN5	*1-564-004-00	PIN, CONNECTOR 5P			
CN6	1-562-887-11	CONNECTOR, F.P.C 20P			
CN101	1-560-914-00	POST, CONNECTOR 2P			
CN1011	*1-561-724-00	SOCKET, CONNECTOR			
		DIODE			
D1	8-719-911-19	DIODE 1SS119			
D2	8-719-911-19	DIODE 1SS119			
D101	8-719-109-84	ZENER DIODE RD5.1ESB1			
D102	8-719-109-90	ZENER DIODE RD5.6ESB3			
D103	8-719-911-19	DIODE 1SS119			
D104	8-719-911-19	DIODE 1SS119			
		IC			
IC1	8-759-705-58	IC NJM4558D-D			
IC2	8-759-990-82	IC TL082CP			
IC3	⚠8-759-700-65	IC NJM79L05A			
		COIL			
L1	1-408-420-00	INDUCTOR	82UH		
L2	1-408-420-00	INDUCTOR	82UH		
L3	1-408-421-00	INDUCTOR	100UH		
		TRANSISTOR			
Q1	8-729-600-27	TRANSISTOR 2SC634SP			
Q2	8-729-218-42	TRANSISTOR 2SK184			
Q3	8-729-600-27	TRANSISTOR 2SC634SP			
Q4	8-729-600-27	TRANSISTOR 2SC634SP			
Q5	8-729-600-27	TRANSISTOR 2SC634SP			
Q6	8-729-600-27	TRANSISTOR 2SC634SP			
Q7	8-729-117-54	TRANSISTOR 2SA1175			
Q101	8-729-204-33	TRANSISTOR 2SA1048-GR			
Q102	8-729-600-27	TRANSISTOR 2SC634SP			
Q103	8-729-204-33	TRANSISTOR 2SA1048-GR			

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part numer specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No	Part No.	Description				Remark
Q104	8-729-204-33	TRANSISTOR 2SA1048-GR				
Q105	8-729-804-86	TRANSISTOR 2SB1142-S				
Q106	8-729-900-63	TRANSISTOR DTA124ES				
Q107	8-729-600-27	TRANSISTOR 2SC634SP				
Q108	8-729-374-02	TRANSISTOR 2SB740				
		RESISTOR				
R1	1-249-421-11	CARBON	2.2K	5%	1/4W	
R2	1-249-421-11	CARBON	2.2K	5%	1/4W	
R3	1-249-412-11	CARBON	390	5%	1/4W	
R4	1-249-419-11	CARBON	1.5K	5%	1/4W	
R5	1-249-416-11	CARBON	820	5%	1/4W	
R6	1-249-417-11	CARBON	1K	5%	1/4W	
R7	1-249-421-11	CARBON	2.2K	5%	1/4W	
R8	1-249-421-11	CARBON	2.2K	5%	1/4W	
R9	1-249-420-11	CARBON	1.8K	5%	1/4W	
R10	1-249-429-11	CARBON	10K	5%	1/4W	
R11	1-249-429-11	CARBON	10K	5%	1/4W	
R12	1-249-413-11	CARBON	470	5%	1/4W	
R13	1-249-415-11	CARBON	680	5%	1/4W	
R15	1-249-417-11	CARBON	1K	5%	1/4W	
R16	1-249-413-11	CARBON	470	5%	1/4W	
R17	1-249-413-11	CARBON	470	5%	1/4W	
R51	1-249-425-11	CARBON	4.7K	5%	1/4W	
R52	1-249-425-11	CARBON	4.7K	5%	1/4W	
R53	1-249-439-11	CARBON	68K	5%	1/4W	
R54	1-249-424-11	CARBON	3.9K	5%	1/4W	
R55	1-249-425-11	CARBON	4.7K	5%	1/4W	
R56	1-249-425-11	CARBON	4.7K	5%	1/4W	
R57	1-249-439-11	CARBON	68K	5%	1/4W	
R58	1-249-424-11	CARBON	3.9K	5%	1/4W	
R59	1-249-437-11	CARBON	47K	5%	1/4W	
R60	1-249-437-11	CARBON	47K	5%	1/4W	
R61	1-249-413-11	CARBON	470	5%	1/4W	
R62	1-249-413-11	CARBON	470	5%	1/4W	
R63	1-249-405-11	CARBON	100	5%	1/4W	
R64	1-249-405-11	CARBON	100	5%	1/4W	
R65	1-249-425-11	CARBON	4.7K	5%	1/4W	
R66	1-249-425-11	CARBON	4.7K	5%	1/4W	
R101	1-249-441-11	CARBON	100K	5%	1/4W	
R102	1-249-431-11	CARBON	15K	5%	1/4W	
R103	1-249-441-11	CARBON	100K	5%	1/4W	
R104	1-249-423-11	CARBON	3.3K	5%	1/4W	
R105	1-249-423-11	CARBON	3.3K	5%	1/4W	
R106	1-249-414-11	CARBON	560	5%	1/4W	
R107	1-249-418-11	CARBON	1.2K	5%	1/4W	
R108	1-249-433-11	CARBON	22K	5%	1/4W	
R109	1-249-429-11	CARBON	10K	5%	1/4W	
R110	1-215-421-00	METAL	1K	1%	1/6W	
R111	1-215-422-00	METAL	1.1K	1%	1/6W	
R112	1-249-413-11	CARBON	470	5%	1/4W	
R113	1-249-417-11	CARBON	1K	5%	1/4W	
R114	1-215-430-00	CARBON	2.4K	5%	1/4W	

DUS-23

Ref.No	Part No.	Description			Remark
	*1-614-057-13	DUS-23 BOARD			
		**********			
	*1-564-014-00	PIN, CONNECTOR 4P			
		CAPACITOR			
C1	1-124-247-00	ELECT	10MF	20%	25V
C2	1-124-247-00	ELECT	10MF	20%	25V
		MISCELLANEOUS			
		**********			
	⚠1-413-185-11	SWITCHING REGULATOR (UR-12)			
	1-464-423-22	UNIT, COLOR RF			
	1-464-437-12	RECEIVER, REMOTE CONTROL (REMOTE SENSOR)			
	⚠1-509-841-00	OUTLET, AC			
	*1-509-982-00	CONNECTOR			
	⚠1-534-517-00	CORD, AC			
	1-558-969-11	WIRE, FLEXIBLE CARD 20P			
	*1-561-056-00	HOUSING, IL CONNECTOR 12P			
	1-561-671-00	SOCKET, MULTI CONNECTOR 8P			
	*1-562-148-11	HOUSING, CONNECTOR 3P			
CN1	1-561-781-11	CONNECTOR, BNC (VIDEO OUT)			
CN2	1-560-553-00	TERMINAL, SOLDERLESS 8P (TV)			
CN3	1-561-781-11	CONNECTOR, BNC (SYNC IN)			
J2	1-507-195-21	SPECIAL REMOTE CONTROL JACK (REMOTE)			
J3	1-507-195-21	SPECIAL REMOTE CONTROL JACK (LOCK PULSE)			
M1	X-3705-058-1	MOTOR ASSY (SLIDE)			
M2	8-838-084-01	MOTOR, DC (BHF-1700B) (SPINDLE)			
M3	1-541-376-11	MOTOR (LOADING)			
PM1	⚠1-454-274-22	SOLENOID, PLUNGER (BRAKE)			

ACCESSORIES AND PACKING MATERIALS

Part No.	Description	Remark
⚠1-534-763-00	COAXIL CABLE ASSY	
*3-688-351-01	CUSHION (UPPER)	
*3-688-352-01	CUSHION (LOWER)	
*3-688-353-03	INDIVIDUAL CARTON	
3-688-386-01	LABEL, SERIES	
3-760-287-21	MANUAL, INSTRUCTION	
*4-323-658-01	SHEET, PROTECTION	

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Replace only with part numer specified.

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[ELECTRICAL ADJUSTMENT]

At the adjustment, see the parts arrangement diagram relevant to the adjustment on page 66.

1. MEASUREMENT TOOL

- Oscilloscope
- Color monitor TV
- Wow meter
- Level meter
- Frequency counter
- Remote commander (RM-2001 or RM-1002)
- SERVO CHECKER Jig (J-6166-370-A)
- Alignment disc REF5A-12CAD (8-847-018-00) (Can be used REF5, REF5B and REF5C)
- Alignment disc REF4B-12AM-5 (8-847-016-00)
- Alignment driver (for SKEW adjustment)
- Connection harness (5P-5P)

2. CAUTIONS ON ADJUSTMENT

- Do not open or close the disc table while standing up the player on its side. (Do not press the OPEN button.)
- When standing the player up, set the right side, facing the front panel, downward and turn OFF the power supply.

3. SERVO CHECKER JIG

The servo checker jig is used for detector position check.

- SERVO CHECKER jig (J-6166-370-A)
- Connecting harness 5P-5P

3-1. Connections

1) Connect 5P connector of connecting harness to CN2 on rear panel of SERVO CHECKER jig.
2) Remove upper cover of the player and connect 5P connector of connecting harness from the jig to CN5 (Adjusting connector) on RF-13 board.

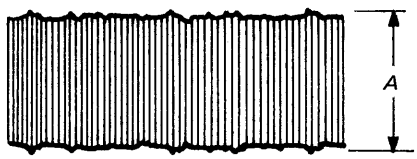
4. OPTICAL BLOCK SYSTEM ADJUSTMENT

4-1. RF Level Check (DM-14 Board)

Mode	STILL
Signal	REF4 disc, frame 100
Measurement Point	TP1 (Pin 3 of CN1)
Measuring Instrument	Oscilloscope
Specified Value	1.3 ±0.3 Vp-p

Checking method:

1) Check that the RF level is 1.3 ±0.3 Vp-p.



A = 1.3 ±0.3 Vp-p

Fig. 1.

4-2. Detector Position Check (RF-13 Board)

Mode	PLAY
Signal	REF4 disc arbitrary section
Measurement Point	CN5
Measuring Instrument	SERVO CHECKER and oscilloscope (DC range)
Specified Value	$\|X\| + \|Y\| \leqq 50\%$

Connection:

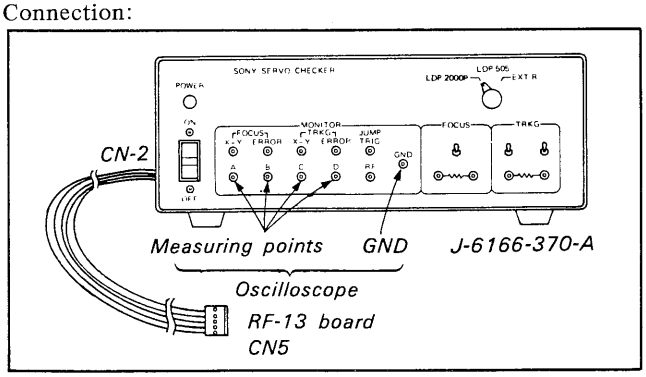


Fig. 2.

Adjusting method:

1) Measure the DC levels A-D on the terminals of the focus/tracking fixture.
2) Calculate X and Y and check that the specified value is satisfied.

$$X = \frac{(A + C) - (B + D)}{A + B + C + D} \times 100\ (\%)$$

$$Y = \frac{(A + D) - (B + C)}{A + B + C + D} \times 100\ (\%)$$

Specificated value: $|X| + |Y| \leqq 50\%$

4-3. Laser Iop Check (RF-13 Board)

Mode	PLAY or STILL
Signal	REF4 disc arbitrary section
Measurement Point	CN101
Measuring Instrument	DC ammeter
Specified Value	See Fig. 4.

Connection:

1) Disconnect a short socket on CN101/RF-13 board, and connect a dc ammeter as follows.

Note: Before a short socket disconnects from CN101, turn off the power switch of the LDP-2000.
Be sure to put on a wrist-strap for grounding (with impedance lower than $10^8\Omega$) whose other end is grounded. The strap works to drain away the static electricity build-up on the human body.

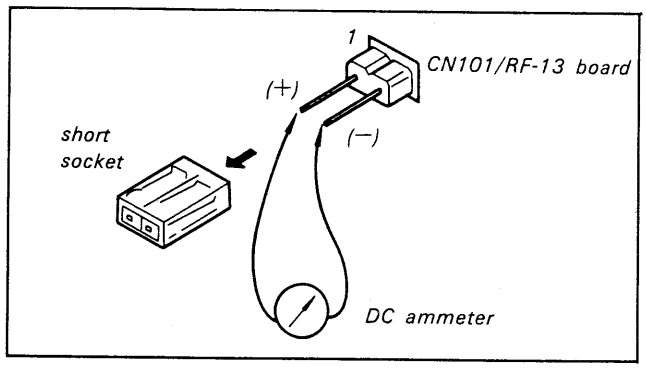


Fig. 3.

Checking method:

1) Check that the laser operation current satisfies the specified value.

Specified value: [Reading of an ammeter] = [Value mentioned label] ±10mA

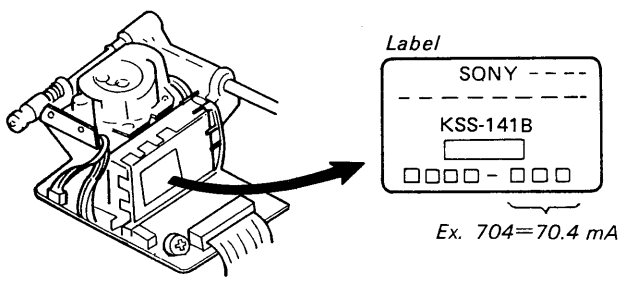


Fig. 4.

4-4. Skew Servo Adjustment (Optical Block)

Mode	STILL
Signal	REF5 frame 17
Measurement Point	Confirm with monitor TV screen.
Measuring Instrument	
Adjusting Element	See Fig. 5
Specified Value	Minimum crosstalk

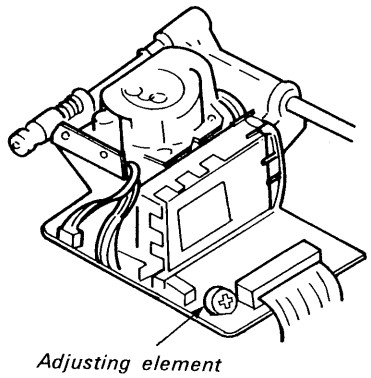


Fig. 5.

Adjusting method:

1) Minimize the crosstalk with the Adjusting element.

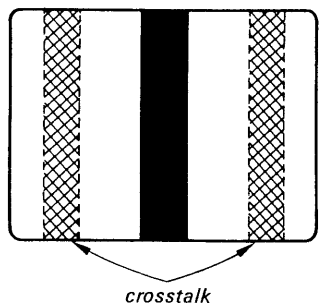


Fig. 6.

5. VIDEO SYSTEM ADJUSTMENT

5-1. Subcarrier Frequency Adjustment (SV-26 Board)

Mode	STOP
Signal	No signal
Measurement Point	Pin ① of CN501
Measuring Instrument	Frequency counter
Adjusting Element	CV101
Specified Value	3,579,545 ±5 Hz

5-2. Demodulator Video Level Adjustment (DM-14 Board)

Mode	STILL
Signal	REF4 disc, frame 27,000
Measurement Point	TP6 (Pin ④ of IC3)
Measuring Instrument	Oscilloscope
Adjusting Element	RV2
Specified Value	2.00 ±0.01 Vp-p

Adjustment method:

1) Adjust to 2.00 ±0.01 Vp-p with RV2.

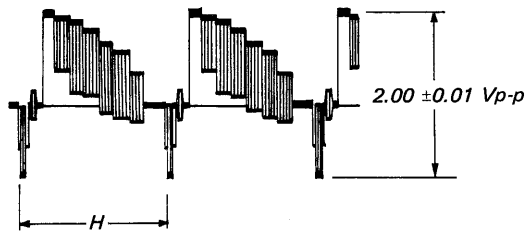


Fig. 7.

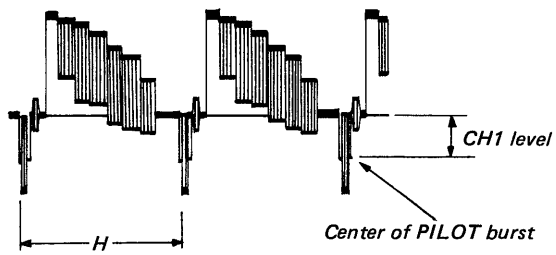
5-3. 1H Delay Video Level Adjustment (DM-14 Board)

Mode	STILL
Signal	REF4 disc, frame 27,000
Measurement Point	CH1: TP6 (Pin ④ of IC3) CH2: TP4 (Pin ② of IC3)
Measuring Instrument	Oscilloscope
Adjusting Element	RV3
Specified Value	CH2 signal level is equal to CH1 signal level

Adjustment method:

1) Adjust RV3 so that the signal level of the CH2 is equal to the one of CH1.

- *CH1*



- *CH2*

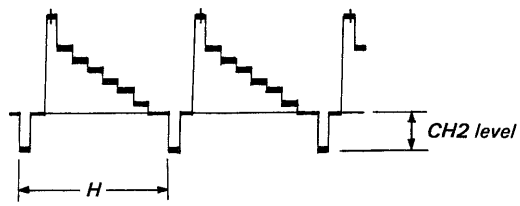


Fig. 8.

5-4. DOC Sensitivity Adjustment (DM-14 Board)

Mode	POWER ON without a disc
Signal	5.3 ±0.05 MHz 200 mVp-p sine wave at TP1 (Pin ③ of CN1) by a signal generator
Measurement Point	TP4 (Pin ① of IC1)
Measuring Instrument	Oscilloscope
Adjusting Element	RV1
Specified Value	4 Vp-p random pulses

Connection:

1) Disconnect the CN1 from the DM-14 board.

Adjusting method:

1) Adjust RV1 so that random pulses are output.
2) Change the input signal to 5.5 MHz 200 mVp-p.
3) Check that the TP3 signal level is 0 V dc.
4) Change the input signal to 5.0 MHz 200 mVp-p.
5) Check that the TP3 signal level is 4 V dc.

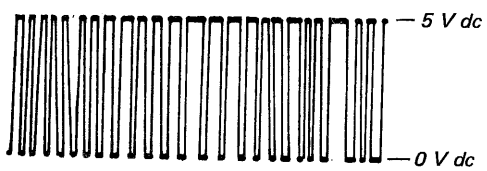


Fig. 9.

5-5. FRAME DATA Input Level Adjustment (DM-14 Board)

Mode	STILL
Signal	REF4 disc, frame 27,000
Measurement Point	TP301
Measuring Instrument	Oscilloscope
Adjusting Element	RV301
Specified Value	2.00 ±0.01 Vp-p

Adjusting method:

1) Adjust to 2.00 ±0.01 Vp-p with RV301.

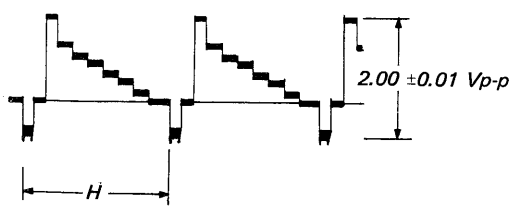


Fig. 10.

5-6. CCD BIAS Adjustment (DM-14 Board)

Mode	STILL
Signal	REF4 disc, frame 27,000
Measurement Point	TP201
Measuring Instrument	Oscilloscope (DC range)
Adjusting Element	RV4
Specified Value	2.7 ±0.1 V dc

Adjusting method:

1) Adjust to 2.7 ±0.1 V dc with RV4.

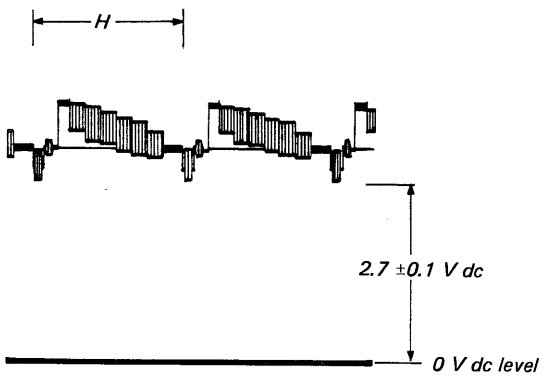


Fig. 11.

5-7. VCO Center Adjustment (DM-14 Board)

Mode	STILL
Signal	REF4 disc, frame 27,000
Measurement Point	CH1: TP6 CH2: TP201
Measuring Instrument	Oscilloscope
Adjusting Element	RV5
Specified Value	6.5 ±1.0 μsec

Connection:

1) Connect TP103 and TP104 with a jumper wire.

Adjusting method:

1) Adjust to 6.5 ±1.0 μsec with RV5.

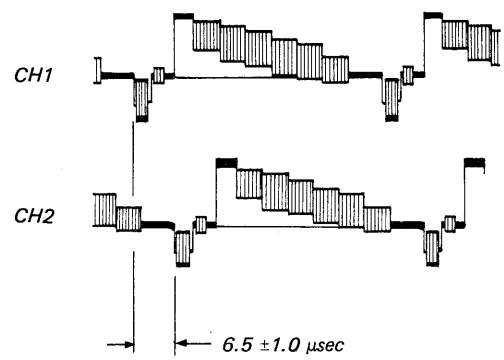


Fig. 12.

5-8. TBC. ED VIDEO OUT Level Adjustment (DM-14 Board)

Mode	STILL
Signal	REF4 disc, frame 27,000
Measurement Point	TP205
Measuring Instrument	Oscilloscope
Adjusting Element	RV201
Specified Value	2.1 ±0.1 Vp-p

Adjusting method:

1) Adjust to 2.1 ±0.1 Vp-p with RV201.

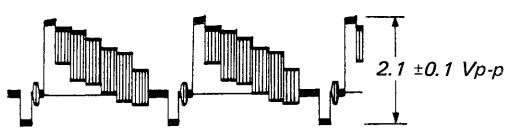


Fig. 13.

5-9. REF SYNC Delay Adjustment (DM-14 Board)

Mode	STILL
Signal	REF4 disc, frame 27,000
Measurement Point	CH1:Pin ① of IC104 CH2: TP205
Measuring Instrument	Oscilloscope
Adjusting Element	RV105
Specified Value	The waveform locks as shown Fig. 14.

Adjusting method:

1) Adjust RV105 so that the waveform locks as shown in Fig. 14.

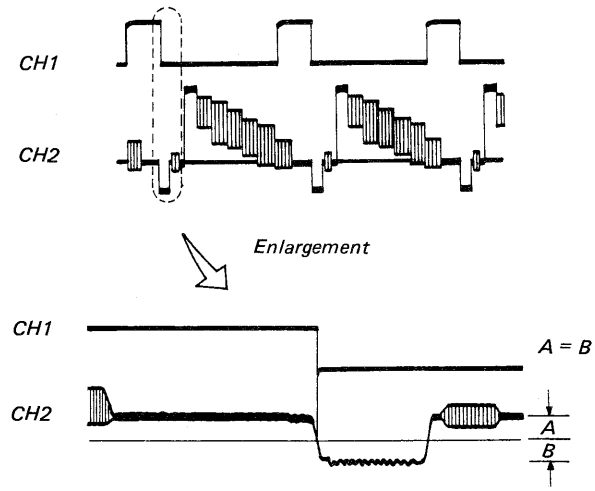


Fig. 14.

5-10. TBC HALF H KILLER Adjustment (DM-14 Board)

Mode	STILL
Signal	REF4 disc, frame 27,000
Measurement Point	TP207
Measuring Instrument	Oscilloscope
Adjusting Element	RV104
Specified Value	τ = 6.0 ±0.1 μsec

Adjusting method:

1) Adjust to 6.0 ±0.1 μsec with RV104.

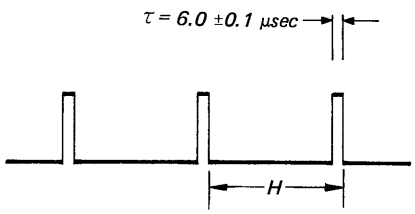


Fig. 15.

5-11. CBH Position Adjustment (DM-14 Board)

Mode	STILL
Signal	REF4 disc, frame 27,000
Measurement Point	CH1: TP101 CH2: TP102
Measuring Instrument	Oscilloscope
Adjusting Element	RV103
Specified Value	The waveform locks as shown in Fig. 16.

Adjusting method:

1) Adjust RV103 so that the waveform locks as shown in Fig. 16.

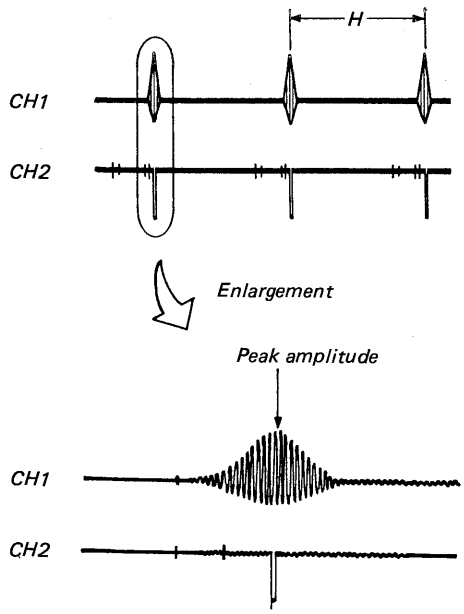


Fig. 16.

6. AUDIO SYSTEM ADJUSTMENT

6-1. TBC Centering Adjustment (AU-33 Board)

Mode	STOP
Signal	Square wave of 1 kHz
Measurement Point	CH1: TP2 CH2: TP3
Measurement Tool	Oscilloscope
Adjusting Element	RV2
Specified Value	τ = 70 ±3 μsec

Connection:

1) Connect TP4 (Pin ③ of CN1) and GND with a jumper wire.
2) Input square wave of 1 kHz, 0.2 Vp-p in corporated with oscilloscope to TP2 through a 100 μF/16 V capacitor.

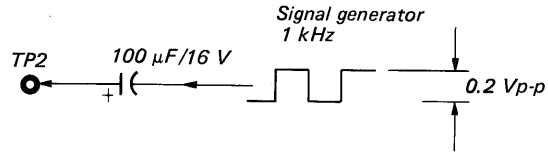


Fig. 17.

Adjusting method:

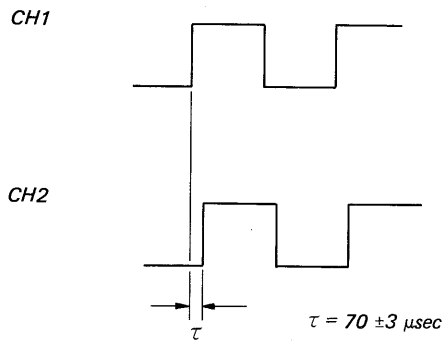


Fig. 18.

6-2. TBC GAIN Adjustment (AU-33 Board)

Mode	FWD PLAY
Signal	REF4 disc, frame 300–1500
Measurement Point	Line out jack CH1/L or CH2/R
Measuring Instrument	Wow meter
Adjusting Element	RV1
Specified Value	Minimum and less than 0.01%

Note: Line out jucks should be terminated by 47 kΩ.

6-3. LINE OUT Level Adjustment (AU-33 Board)

Mode	FWD PLAY
Signal	REF4 disc, frame 4200–5400
Measurement Point	LCH: Line out juck CH1/L RCH: Line out juck CH2/R
Measuring Instrument	Audio level meter
Adjusting Element	LCH: RV3 RCH: RV4
Specified Value	2.5 ±0.5 dBs

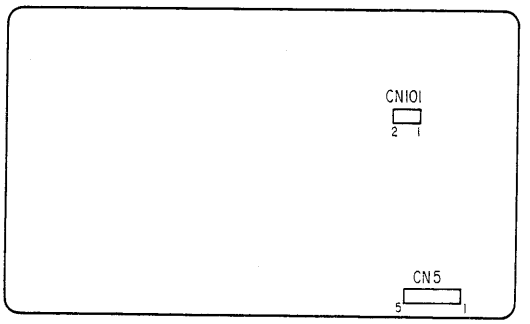
Note: Line out jucks should be terminated by 47 kΩ.

Adjusting method:

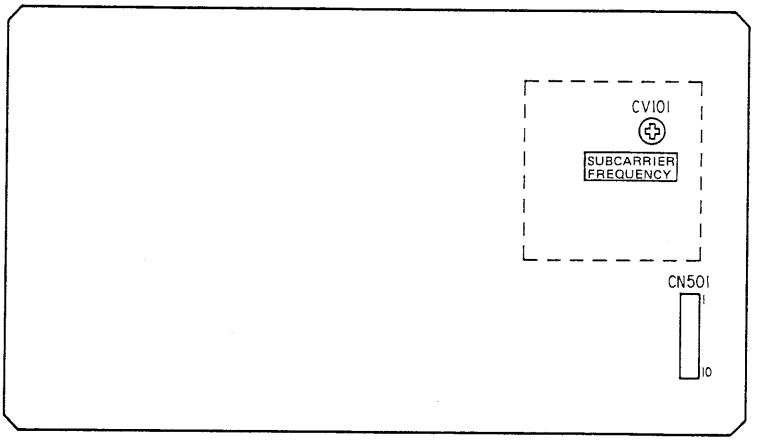
1) Adjust to 2.5 ±0.5 dBs with RV3 (or RV4).

7. PARTS ARRANGEMENT DIAGRAM RELEVANT TO THE ADJUSTMENT

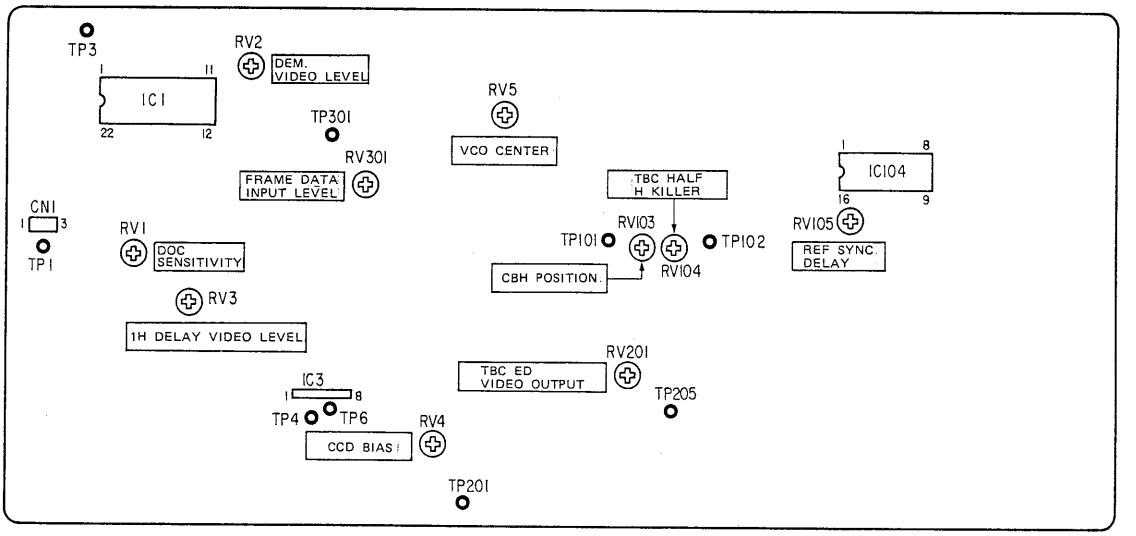
RF-13 BOARD (COMPONENT SIDE)



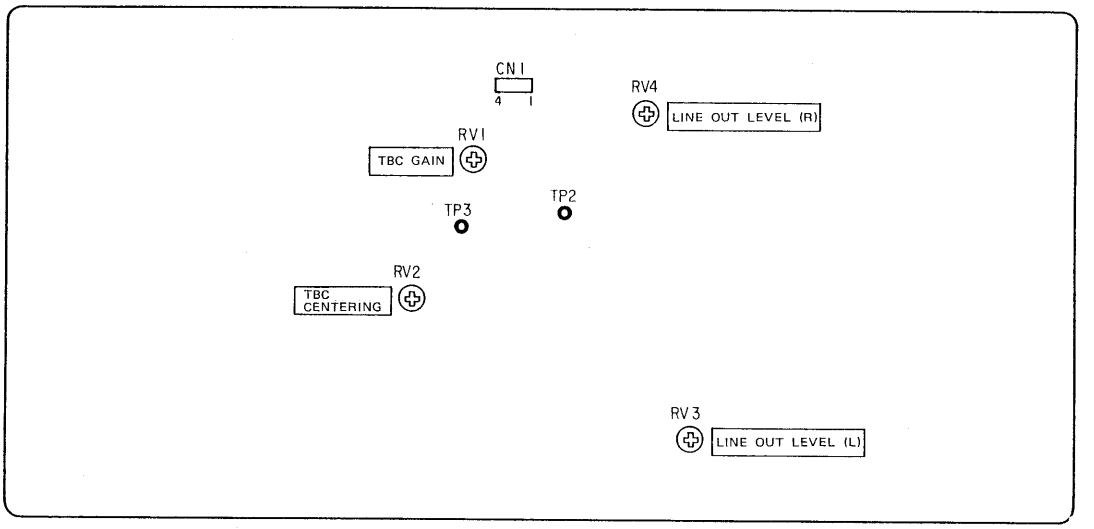
SV-26 BOARD (SOLDER SIDE)



DM-14 BOARD (SOLDER SIDE)



AU-33 BOARD (SOLDER SIDE)



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LDP-2000

SONY®

SERVICE MANUAL

US Model
Canadian Model

Serial No. 112,297 and later

SUPPLEMENT-5

Subject: Safety interlock switch deletion

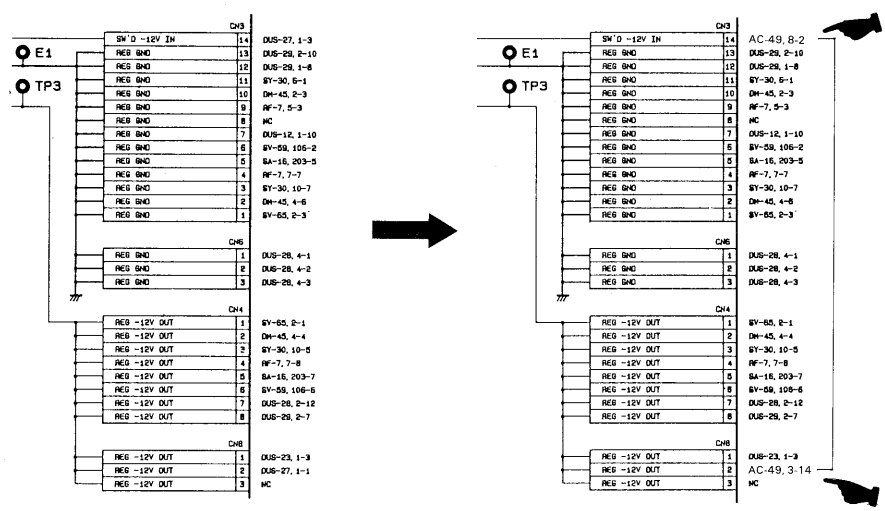
- File this supplement with the service manual and supplement-1 – 4.
- According to safety interlock switch deletion, the following portions have been changed.

(1) Service Manaul Page 7-76

AC-49 board Frame Wiring change

☛ : changed portion

FORMER **NEW**



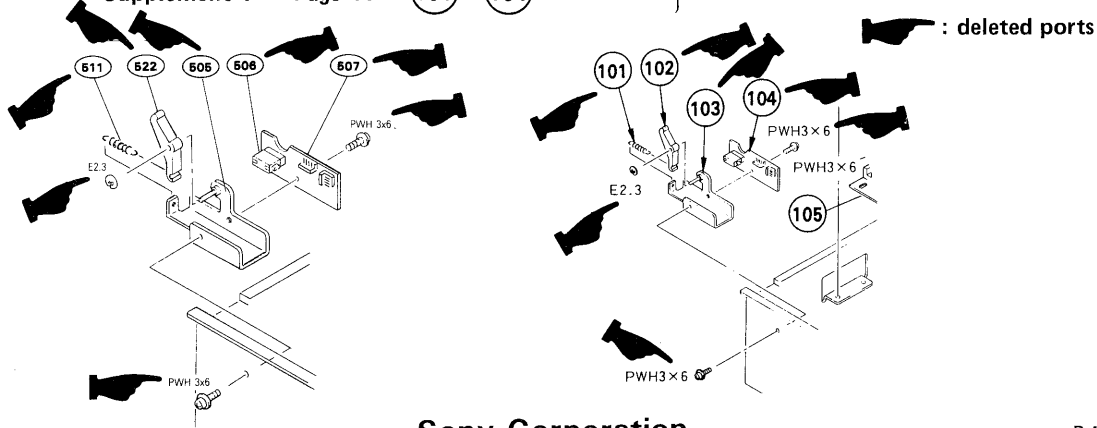
(2) Service Manual Page 7-85

DUS-27 board deletion

(3) Service Manual Page 8-15 (505) – (507), (511), (522) } **deletion**

Supplement-4 Page 41 (101) – (104) }

☛ : deleted ports



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